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FINANCIAL STABILITY IN ICELAND

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Professor Herbertsson has been a consultant to private companies, institutions and international organizations, such as the World Bank, the International Monetary Fund, the Nordic Council of Ministers, and the OECD. He has been a member of and chaired many ministerialy appointed committees in Iceland and has been a consultant to the governments of Belgium, Croatia, Denmark, Finland, Iceland, Norway, Sweden, and Uganda.

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Professor Mishkin is currently an associate editor (member of the editorial board) at six academic journals and has been a consultant to the Board of Governors of the Federal Reserve System, the World Bank, the Inter-American Development Bank, and the International Monetary Fund, as well as to numerous central banks throughout the world. He was also a member of the International Advisory Board to the Financial Supervisory Service of South Korea and is currently an advisor to the Institute for Monetary and Economic Research at the Bank of Korea. He is currently an academic consultant to and serves on the Economic Advisory Panel of the Federal Reserve Bank of New York.

CONTENTS

EXECUTIVE SUMMARY

There has been good and bad news for the Icelandic economy. The good news is that it is recieving a lot of attention. The bad news is that it is recieving a lot of attention. Recent volatility in Iceland's asset markets have raised concerns about the fragility of Iceland's economy. In this respect many have looked to the country's large current account deficit. This study provides a framework for evaluating financial fragility by examining the fundamentals of Iceland's economy to see whether they suggest that the country could go down the traditional routes to financial instability.

Iceland is unique in that it is the smallest economy in the world to have its own currency and a flexible exchange rate. It has experienced high current account deficits before, but rapid adjustment has taken place in the past without significantly stressing the Icelandic financial system. Iceland is also an advanced country with excellent institutions (low corruption, rule of law, high education, and freedom of the press). In addition, its financial regulation and supervision is considered to be of high quality. Iceland also has a strong fiscal position that is far superior to what is seen in the United States, Japan and Europe. Iceland's financial sector has undergone a substantial liberalization, which was complete over a decade ago, and its banking sector has been transformed from one focused mainly on domestic markets to one providing financial intermediation services to the rest of the world, particularly Scandinavia and the UK.

There are three traditional routes to financial instability that have manifested themselves in recent financial crises: 1) financial liberalization with weak prudential regulation and supervision, 2) severe fiscal imbalances, and 3) imprudent monetary policy. None of these routes describe the current situation in Iceland. The economy has already adjusted to financial liberalization, which was already completed a long time ago, while prudential regulation and supervision is generally quite strong. Fiscal imbalances are not a problem in Iceland: quite the opposite, with Iceland having an excellent fiscal position with low government net debt (less that 10% of GDP) and a fully funded pension system (with assets amounting to more than 120% of GDP). Monetary policy has also been

successful in keeping inflation low and near the inflation target, particularly when housing prices are excluded from the inflation measure, as is the case in the United States and the eurozone. It is true, however, that Iceland is running very large current account deficits, but current account deficits by themselves do not lead to financial instability. Our analysis indicates that the sources of financial instability that triggered financial crises in emerging market countries in recent years are just not present in Iceland, so that comparisons of Iceland with emerging market countries are misguided.

The fact that Iceland is not going down traditional routes to financial instability does not mean that there are no other potential problems looming. There are concerns that the banks could experience refinancing problems. Although the banks' reliance on external financing poses the biggest risk to the financial system right now, the probability of a credit event occurring is low. The rapid credit growth in the banking system and the banks' transformation from concentrating on domestic lending, to becoming international financial intermediaries, also presents some risk because the banks may not have been able to develop organizational capital fast enough to run their new business safely. These concerns have led to criticism of Iceland's banks for lack of transparency. However, the Financial Supervisory Authority's awareness of these risks and the fact that Iceland has high quality governmental institutions make it unlikely that there are serious problems with safety and soundness in the banking system.

Iceland's small size and openness make it more vulnerable because small changes in financial flows as a percentage of overall flows in international flows in financial markets can have a huge impact on Iceland's asset prices and particularly the exchange rate. Self-fulfilling prophecies, otherwise known as multiple equilibria, in which concerns about an Icelandic financial meltdown could lead to massive withdrawals out of Icelandic assets, which would then lead to a financial meltdown, even if fundamentals do not warrant it, cannot be ruled out. However, research on multiple equilibria suggests that self-fulfilling prophecies are unlikely to occur when fundamentals are strong, as they are in Iceland.

The analysis in our study suggests that although Iceland's economy does have some imbalances that will eventually be reversed, financial fragility is currently not a problem, and the likelihood of a financial meltdown is low. However, the possibility that multiple equilibria might occur suggests that policy measures to bolster confidence in the Icelandic economy and financial system would be beneficial. We suggest four such measures: 1) financial supervision might be more effective if it

were consolidated inside the Central Bank; 2) Iceland's commercial banks should be encouraged and should also see that it is in their own interest to disclose more information about their activities; 3) the inflation measure used for the inflation target should minimize the influence of housing price fluctuations, and; 4) the government should implement a formal fiscal rule to dampen the Icelandic business cycle. These measures are by no means exhaustive but could help improve the future stability of the Icelandic economy.

INTRODUCTION

For such a small country, Iceland has been receiving an enormous amount of attention in the financial media. After Fitch Ratings downgraded the outlook for long-term Icelandic Treasury securities from stable to negative on February 21st this year, financial markets in Iceland have been in turmoil. With several other negative reports by bank analysts, the Icelandic krona (ISK) fell by more than 15% in the course of the next month, while the Iceland stock market (ICEX-15 equity price index) fell by a similar amount (but by about 4% since the beginning of this year). With this increased volatility and concern about the huge current account deficit of over 16% of GDP, some analysts have raised the possibility that Iceland might undergo a financial meltdown, similar to ones that we have seen in recent years in emerging market countries. Do these fears have any validity?

To assess whether Iceland's economy is fragile, it is important to understand the unique features of Iceland's economy and then use deeper analysis of why financial fragility occurs to evaluate the potential for serious disruptions to Iceland's financial system. We begin our study with an overview of the Icelandic economy and then turn to a general analysis of why financial instability occurs. We can then use this analysis to ask whether Iceland is going down the traditional path to financial instability. We find that the answer is no. However, Iceland's unique situation raises some potential concerns about other possible sources of financial instability, and we examine them in order to provide a fuller assessment of the risks to the Icelandic economy. Although we conclude that Iceland's economy and financial system are on sound footing, we believe that adoption of certain policy measures might help more rapidly restore confidence in Iceland's economy and restore the country's financial markets to normalcy more quickly.

CHAPTER 1

OVERVIEW OF THE ICELANDIC ECONOMY

There are four features of the Icelandic economy that are particularly relevant to evaluating financial fragility: 1) its unique size, 2) its excellent institutional framework, 3) its strong fiscal position, and 4) its unique financial system.

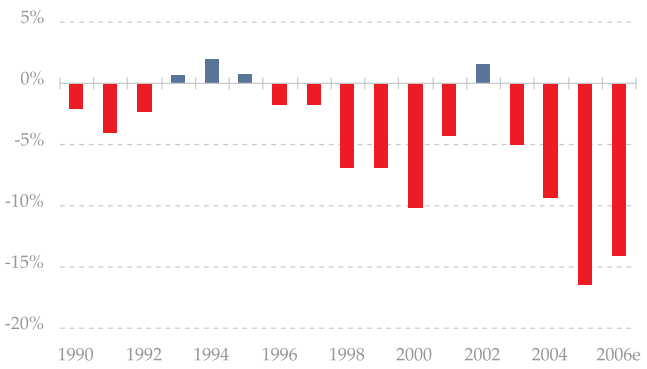
1.1 UNIQUE IN SIZE

Iceland is the smallest sovereign state in the world that has an independent monetary policy, with only 300 thousand inhabitants. Since 2001 its policy has been based on inflation targeting and a floating exchange rate.

Flexibility and the current account

In recent years a large and growing current-account deficit (Figures 1 and 2) has been a topic of debate as well as a source of criticism of economic-policy management in Iceland as in many countries. Although Iceland has a generally favorable economic situation—with large private investments, rapid economic growth, and low unemployment—the spiraling external deficit has raised concerns in the international financial community.

FIGURE 1:
CURRENT ACCOUNT GDP RATIO



Source: Central Bank of Iceland

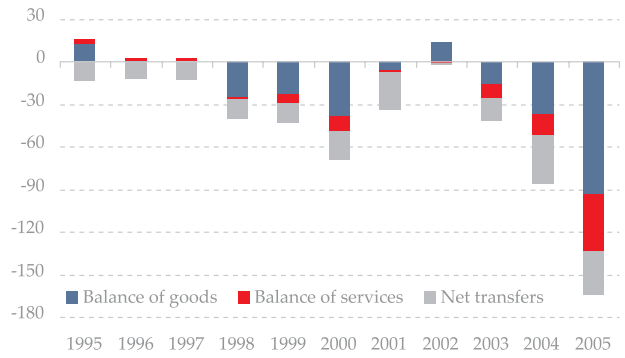


FIGURE 2:
CURRENT ACCOUNT BREAKDOWN, bISK

Source: Central Bank of Iceland

By definition, the current account is the difference between domestic investment and savings. As such it measures the change in the nation's net foreign assets, the difference between foreign assets and the external debt. When domestic investment exceeds domestic savings, the net asset position deteriorates and imports in excess of exports are paid for by borrowing or by the sale of domestically owned assets.

Depending on why it is occurring, a current-account deficit could result from optimal behavior on the part of households, firms, and government. Current account deficits thus do not necessarily constitute a macroeconomic problem, and a strictly balanced current account should not belong to the list of key policy goals. A current account deficit—that is, foreign savings—can be used to finance increased domestic investment as well as consumption.

Increased investment results in higher output in the future as well as higher interest payments on foreign debt. If the investment is sufficiently profitable (i.e., has a positive net present value), future generations will then benefit. Research also shows that demographic effects may be of paramount importance in causing either persistent surpluses or deficits. Nations largely at work should have current-account surpluses, while those with proportionately more young and old people should have deficits.[1] The former is saving for retirement, while the latter is running down past and future savings. Iceland has a young population.

If a current account deficit coincides with low investment, there is a concern that the current account deficit might result from too much consumption (not enough saving). But even here, a current

[1] *Tryggvi Thor Herbertsson and Gylfi Zoega (1999). "Trade Surpluses and Life-cycle Saving Behaviour," Economics Letters 65, No. 2, November, pp. 227-237.*

account deficit can be misleading. If domestic output falls transitorily, or the exchange rate is for some reason unusually favorable for imports, it is optimal behavior for households to smooth consumption over time by borrowing to finance consumption of imported goods (or invest in imported consumer durables). The situation in Iceland in recent years may then well be a mixture of the two. Investment in the metal and energy sector and in residential housing has increased demand in the country, which has in fact forced the Central Bank to increase its policy rate, which has strengthened the ISK and increased imports, and the current account has deteriorated.

Another problem for small countries is the lumpiness nature of investment. As it turns out, firms in an industry that is dependent on the world market usually invest when world prices are high for their products (uncertainty is low). If investments are lumpy, the current account in small countries will be much more volatile than in big, diversified economies. To test the hypothesis we ran statistical tests to investigate the partial relationship between the standard deviation of the current account GDP ratio and the logarithm of population in 175 countries over the period 1980-2004.[2] Our preliminary results show that the Spearman rank correlation (which is a non-parametric correlation test) between the two variables is -0.54, which is high by any standard. To further investigate the relationship, we ran cross-sectional regressions on the variables, see Figure 3.[3]

FIGURE 3:
THE PARTIAL RELATIONSHIP BETWEEN VOLATILITY OF THE CURRENT ACCOUNT GDP RATIO AND SIZE OF COUNTRIES

Source: World Bank and author calculations

In short our hypothesis is supported by the data: small countries have more volatile current accounts than big countries, and one must therefore be cautious in concluding similarities between

[2] *The data is compiled from the World Data Bank, an on-line data base maintained by the World Bank.*

[3] *The estimated equation is: CA = 22.5 - 1.11POP + 27.59D (where White heteroskedasticity-consistent standard errors are: 0.29, 0.14, and 7.29, respectively), CA is the average current account-GDP ratio 1980-2004, POP the natural logarithm of the population 1980, and D is a dummy variable for outliers (outliers are defined here as observations that lie outside two standard deviations of the mean of the sample). The regressors capture about 60% of the variation in the dependent variable (i.e., R2 (adjusted for degrees of freedom) is 0.60).*

countries on the basis of current account deficits. However, the puzzling fact that the current account in Iceland is only marginally more volatile than in the US and China remains to be explained.

As history shows, another characteristic of the Icelandic economy is a highly volatile exchange rate and rapid adjustment of the current account via the exchange rate (see Figure 4). After years of stagnation the Icelandic economy finally took off in 1995, and economic growth was around 4%-5% for six consecutive years until 2002 (see Figure 5). At the same time the current account deficit started to grow, and in 2000 it amounted to more than 10% of GDP (see Figure 1 and 2). With inflationary pressures building up in 2000 the Central Bank raised its policy rates (Figure 6 and 7). Finally, in 2000 the ISK started to depreciate, inflation picked up, and demand contracted, leading to a decline of GDP of around 1% in 2002. From 2000 to 2002, the current account underwent a dramatic swing, improving by over ten percentage points, ending up with a current account surplus of 1.6% of GDP.

FIGURE 4:
THE ISK INDEX

Source Central Bank of Iceland

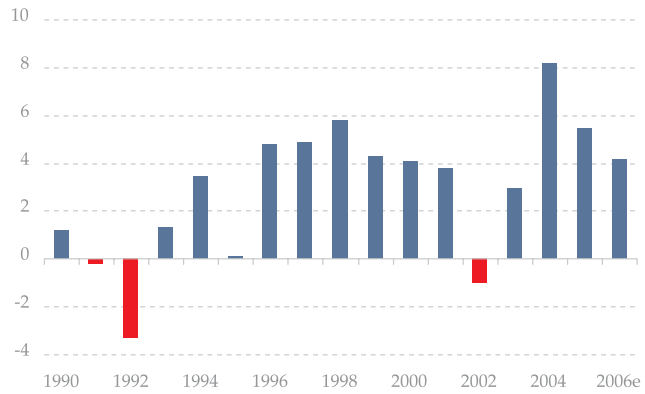
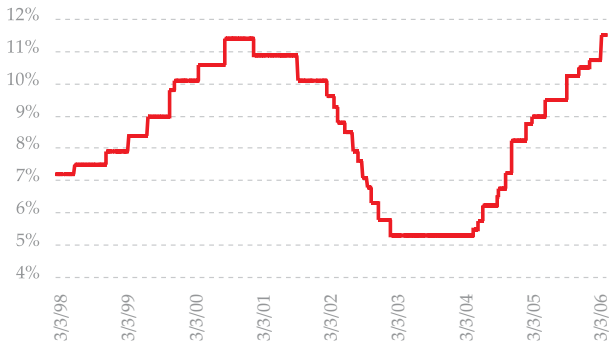


FIGURE 5:
ANNUAL GROWTH OF GDP, %

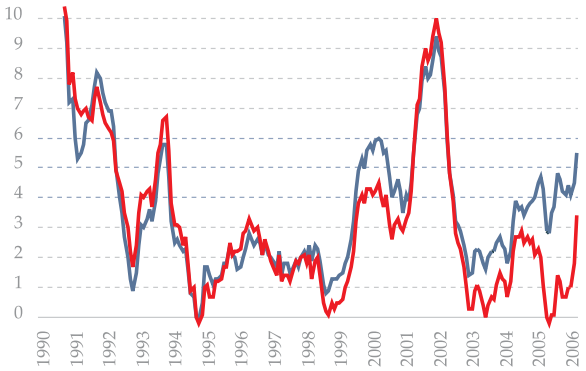
Source: Statistics Iceland

FIGURE 6:
THE POLICY RATE OF THE CENTRAL BANK OF ICELAND



Source: Central Bank of Iceland

FIGURE 7:
INFLATION, %
WITH HOUSING (BLUE) AND WITHOUT HOUSING (RED)



Source: Statistics Iceland

In 2003 inflation was close to the inflation target, of 2.5%, demand picked up, and the economy grew at the rate of 3%. The evolution of the Icelandic economy over this period illustrates how flexible the Icelandic economy is to external shocks. The flexibility arises from the fact that Iceland has modern and efficient institutions that are able to smooth the adjustment process.

1.2. ADVANCED COUNTRY WITH EXCELLENT INSTITUTIONS

Iceland is an advanced country with high-quality institutions. GDP per capita (adjusted for PPP) ranks fifth highest in the world; longevity is the highest for females and second highest for males; unemployment is almost non-existent and way below the natural rate; net government debt is almost nil, labor force participation among older workers the highest in the world, and of women the highest in the OECD (almost 80%, compared with 56% on average in the OECD). Noteworthy among Iceland's country rankings for quality of institutions is that Iceland ranks fifth in economic

freedom, firs in terms of the lowest corruption, seventh in terms of competitiveness, first in the percentage of population connected to the Internet (ADSL or ISDN), and the first in terms of freedom of the press, compared with number 113 for Turkey and 59 for Thailand.[4] These rankings are of course sometimes arbitrary, but they clearly illustrate that Iceland is a well run, advanced Nordic country that has little in common with emerging market countries, a fact important to recognize when we start discussing financial stability in the next section.

TABLE 1: OVERVIEW STATISTICS FOR THE ICELANDIC ECONOMY

GDP Per Capita (US$, PPP) (1)	35,749
GDP Per Capita, Current Exchange Rate (US$) (1)	53,555
GDP Growth 2005 (%) (1)	5.5%
Unemployment Rate (%) (1)	2.4%
Life Expectancy at Birth (years) (9)	80.7
Annual Stock Market Change 2005 (2)	65%
Corruption Perception Index (rank) (3)	1
Worldwide Competitiveness (rank) (4)	4
Growth Competitiveness Index (rank) (5)	7
Political Rights and Civil Liberties (rank) (6)	1
Economic Freedom (rank) (7)	5
Balance of Trade (% of GDP) (1)	-9.3%
Current Account Balance 2005 (% of GDP) (8)	-16.5%
Central Government Revenue (% of GDP) (1)	37.0%
Central Government Expenditure (% of GDP) (1)	33.2%
General Government Financial Balance 2005 (% of GDP) (1)	3.0%
Net Savings (% of GDP) (1)	0.23%
Gross Savings (% of GDP) (1)	12%
Gross Domestic Investment (% of GDP) (8)	28.7%
Central Government, Gross Debt 2005 (% of GDP) (8)	20.2%
Central Government, Net Debt 2005 (% of GDP) (8)	7.7%

The country was an early member of the UN and a founding member of the OEEC (now the

Data sources: (1) Statistics Iceland, (2) Iceland Stock Exchange, (3) Transparency International, (4) IMD World Competitiveness Report, (5) The World Economic Forum, (6) Freedom House, (7) The Wall Street Journal and The Heritage Foundation, (8) Ministry of Finance, (9) OECD

[4] *Worldwide Press Freedom Index (www.rsf.org).*

OECD), the Bretton Woods Agreement and consequently the World Bank and the International Monetary Fund (IMF). The country has a seat on the board of the IMF for two years every 10 years and at the World Bank for three years every 15 years. Iceland is a candidate for the UN Security Council in 2009. Iceland has not drawn on the IMF since 1982 and has not borrowed from the World Bank since the 1960s except for an emergency loan in 1974 because of a volcanic eruption in Vestmanna Islands. The Central Bank of Iceland is independent from politics and has based its monetary policy on inflation targeting since the spring of 2001.

The Financial Supervisory Authority (FSA) is independent from the Central Bank, which, however, monitors overall financial stability in the country. The FSA is entrusted with considerable enforcing powers. It monitors the credit market, the pension system, the insurance market, and the securities market. FSA has access to all information from parties subject to supervision and relevant information from qualified shareholders and others closely linked to the parties. FSA insists on corrective action if activities are not consistent with rules and regulations or sound and proper business practices, and it has the authority to call and chair board meetings. FSA can publicly issue it's interpretations of rules and regulations or guidelines for sound and proper business practices; it can conduct a house search and confiscate any material, relying on a court order; it can impose financial sanctions and withdraws licenses.

The monitoring and inspection activities are both off- and on-site. The off-site approach is based on regular information gathering and analysis. Key reports on the credit system are on capital adequacy, large exposures, connected lending, defaults, liquidity, major interests in non-financial companies, lending collaterised on shares, etc. The analysis is based on general data inspection, stress testing and CAMELS, which is a risk assessment tool focusing on six key variables (capital, asset quality, management, earnings, liquidity, and sensitivity to market risk). The stress testing is discussed in detail in Chapter 3. Iceland implemented the Basel II standard as a part of its fulfillment of the EEA Agreement in 2004.

The on-site inspections are based on benchmark meetings with the management of the banks, where financial results and goals and risks are discussed. The risk categories emphasized are credit, liquidity, market, and operational risks. Furthermore, the FSA monitors how well the bank measures and controls its risk. After the on-site inspections, remarks and requests for corrective actions are sent to the board and management of the banks.

1.3. STRONG FISCAL POSITION

The fiscal position of the central government has been strong over the last 10 years. There has been a government budget surplus in most years (see Figure 8). However, there have been some concerns that this favorable position is due to the current business cycle boom rather than fiscal policies.

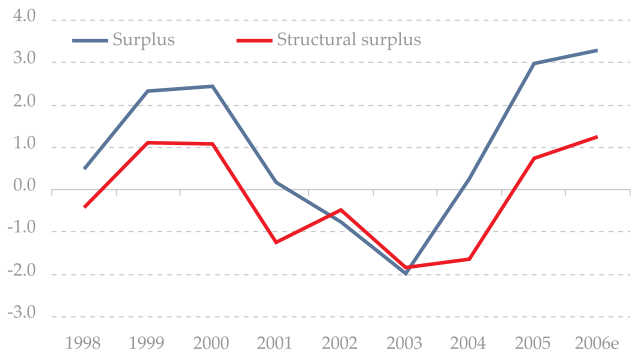


FIGURE 8:
GENERAL GOVERNMENT SURPLUS GDP RATIO, %

Source: Central Bank of Iceland

There is some truth to these concerns because structural fiscal balances (which are adjusted to reflect the state of the business cycle) have not been as favorable.[5] However, the differences are relatively small and do not suggest that fiscal policy is irresponsible. Favorable public finances as well as privatization of state-owned enterprises, such as the banks, have made it possible to repay almost all government debt (see Figure 9). It has been estimated that the net debt of the central government will amount to 1.3% of GDP in 2006, a situation that other European countries would be thrilled to have.

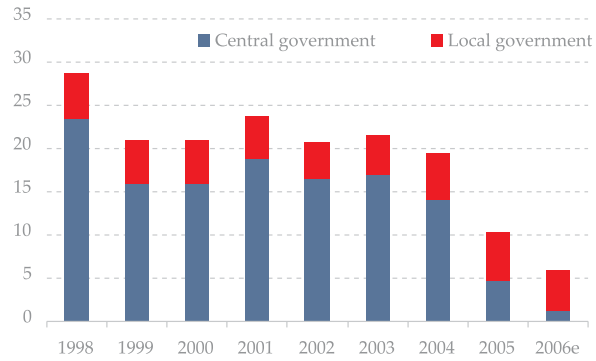


FIGURE 9:
NET GOVERNMENT DEBT GDP RATIO, %

Source: Central Bank of Iceland

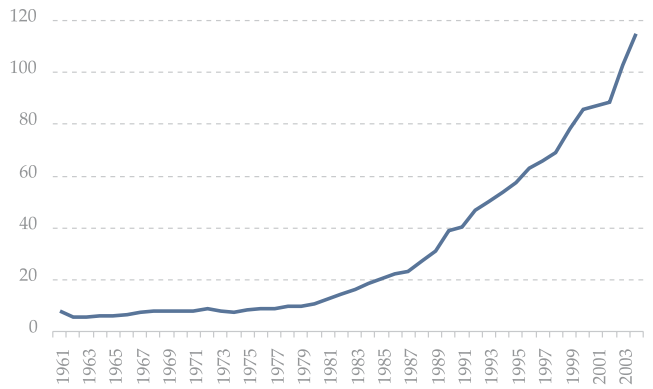
[5] *The balance is calculated such that income and expenditures are corrected for the increase/decrease that occurs because of the business cycle. For example, expenditures increase in recessions due to increased unemployment benefits, and income increases as the tax base gets bigger during booms. The GDP used in the calculation is not the usual one, but potential output.*

Is it enough when discussing countries' fiscal policies to point only to surpluses and explicit debt? The answer is no. Even if the explicit debt is favorable, there could be a ticking time bomb from growing implicit debt due to, e.g., unfunded pension obligations. There are numerous examples of this from around the world, and even from Iceland's neighbors in northern Europe.

Unlike many other countries Iceland is not threatened by a looming pension crisis. A reform of the pension system, which began in 1969, is not only responsible for the stable outlook for future pensions but has also been an important stimulus to the rapid expansion of the country's banking system since 1996.

The pension system in Iceland is chiefly characterized by the operation of occupational pension funds. These funds became general in 1969 and mandatory by law in 1974. Under the agreement, every wage earner working in the private sector is obliged to contribute a minimum of 11% of his wages to an occupational fund of his choice or, in most cases, a fund predetermined by his trade union. However, more than half of the burden is carried by the respective employer, who currently contributes a minimum of 7% of the total contribution. A similar arrangement exists in the public sector.[6]

FIGURE 10:
PENSION FUND ASSETS
GDP RATIO, %



Source: The Icelandic Financial Supervisory Authority

Before 1979, at the time of financial repression the assets of the pension funds were dissipated. But asset growth took off during 1979-1986 when financial indexation and market-determined interest rates were introduced. Assets now amount to more than 120% of the countries GDP (see Figure 10). Prior to the liberalization of the financial system, the pension funds had very few choices for properly investing their funds. However, the almost simultaneous emergence of the new pension

[6] *Tryggvi Thor Herbertsson (2006). "Collective Pension Arrangements: The Case of Iceland," paper prepared for the OECD.*

system and the liberalization of financial markets had powerful interactive effects. Strong demand by the pension funds for financial instruments, combined with new opportunities for supplying securities and bonds, was the catalyst that in the 1990s rapidly triggered a vibrant market for financial securities in Iceland.

The pension fund system also served an indirect educational function by training investment managers and providing challenging opportunities for young experts often educated abroad at major business schools. The opportunity to manage the assets of the pension system as well as the constant need for new financial products provided opportunities for a new generation of financial managers, who were also helped by a stable and favorable economic climate during the 1990s. The outcome has been a dynamic financial system that has outgrown the Icelandic market.

TABLE 2: GENERATIONAL ACCOUNTS, % OF GDP

	Gross external debt	*Implicit debt*	*Intertemporal public liabilities*
1994	42	78	120
1995	44	28	72
1996	43	-5	38
1997	40	-40	0
1998	39	-55	-16
1999	33	-89	-56
2000	36	-79	-43
2001	37	-28	9
2002	36	30	66
2003e	33	42	74
2004e	28	25	53

To investigate further whether Iceland has hidden implicit liabilities we use generational accounts; such accounts have been calculated for Iceland since 1994.[7] The accounts show long-term sustainability of public finances. A generational account is the net present value of expected current and future taxes paid and transfers received over the life by a representative individual of a given age. The sum of generational accounts, for all current and future individuals, forms part of the government intertemporal budget constraint, together with the net present value of other

[7] *Source: Institute of Economic Studies at the University of Iceland.*

government expenditures and government debt. If there is balance between revenues, expenditure, and debt, the current tax structure may be sustained for the future. If the debt is too large, as in countries with looming pension crises, future generations will have to pay for higher intertemporal debt through rising taxes or lower transfers. Implicit public liabilities measure the imbalance proportional to GDP (see Table 2).[8]

If Table 2 is compared with the GDP growth numbers in Figure 5, one observes that the state of implicit debt depends on the business cycle. The table shows that intertemporal public liabilities are in a relatively good state with debt amounting to a little more than 50% of GDP, which is low by international standards, as we can see in Table 3. Unfortunately the latest comparable figures we could find were from 1995.[9]

TABLE 3: GENERATIONAL ACCOUNTS IN SELECTED COUNTRIES, % OF GDP IN 1995

	Intertemporal public liabilities
Norway	10
United States	87
Italy	107
Germany	136
Spain	152
United Kingdom	185
Austria	193
Finland	253

The age structure of the population is young by European standards. It is comparable to that of the US. This is due to longevity and unusually high fertility rates for an industrialized country. Life expectancy at birth is the highest in the world for females (82.8 years) and the second highest after Japan for males (78.9 years). Morbidity rates are also low in Iceland, indicating that costs arising from disability are low in the country. Early retirement is almost unheard of. People normally do not retire until the age of 70 although they could retire at the age of 65 and collect benefits from their pension fund. The official retirement age entitling people to collect social security benefits from the state is 67 years. As a result, Iceland has the highest labor force participation rate of older workers in the world. Total costs from retirement pension benefits amount to approximately 6% of GDP,

[8] *Carl E. Gjersem (2002). "Generational Accounting in the Nordic Countries," Nordic Journal of Political Economy 28, pp. 3-11.*

[9] *See Jagadeesh Gokhale and Bernt Raffelhüsen (1999). "Population Aging and Fiscal Policy in Europe and the US," mimeo.*

about half of which is borne by the state. The comparable figure for neighboring Sweden at the beginning of this century was around 11% of GDP, fully financed out of taxes.[10]

Although public finances are in good order, the gross external debt of the country has grown dramatically the last few years. Since 2000 debt (excluding equity and FDI) has grown from a little more than 100% of GDP to almost 294% of GDP at year-end 2005 (see Figure 11).

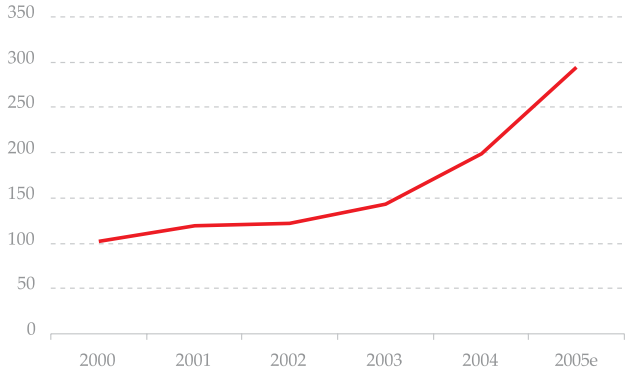


FIGURE 11:
EXTERNAL DEBT GDP RATIO, %

Source: Central Bank of Iceland

Although the majority of the increased foreign debt of Icelanders is due to the banking system's becoming international, the net international investment position has deteriorated in recent years, from 65% of GDP in 2000 to 86% in 2005, where the increase occurred mostly in 2004 and 2005 (compared with 91% in New Zealand) (see Figure 12).

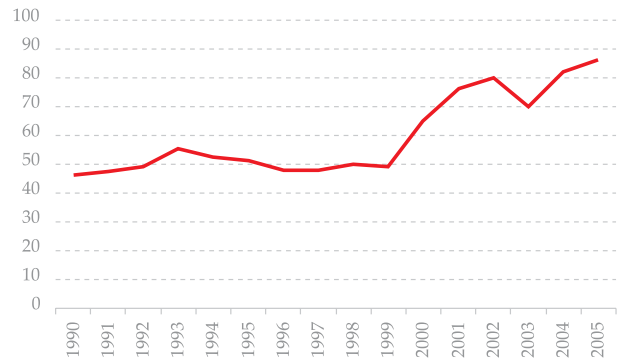


FIGURE 12:
NET INTERNATIONAL INVESTMENT POSITION GDP RATIO, %

Source: Central Bank of Iceland

[10] *Tryggvi Thor Herbertsson, J. Michael Orszag, and Peter Orszag (2000). Retirement in the Nordic Countries: Prospects and Proposals for Reform, a report to the Nordic Council of Ministers (ECOFIN), TemaNord No. 2000:548, Nordic Council of Ministers, Copenhagen.*

This increase of 21 percentage points of GDP was mostly due to increases in housing prices and the financing of investments in the energy sector, with the debt of the biggest energy company, Landsvirkjun, amounting to 12% of year-end GDP in 2005.

1.4. UNIQUENESS OF THE FINANCIAL SECTOR

In the last 120 years Iceland has experienced four types of financial institutions: barter, an immature liberal system, a repressed financial market, and a full-fledged liberal market since 1979. Since the turn of the century the Icelandic banking system has moved into international financial intermediation.[11]

In the first period, which ended in 1886, commercial banks did not exist, and there was primary reliance on barter, while public funds provided limited amounts of credit after 1850. The lack of adequate financial arrangements slowed down nascent modernization of the economy. The second period, 1886 to 1930, saw the emergence of rural savings banks in the last quarter of the nineteenth century and the establishment of the first two commercial banks in 1886 and 1904.

Independence from Denmark in 1918 gradually introduced mistrust of foreign investors and a belief in hands-on government management of financial markets. Private foreign investment was not permitted; access to foreign currency was strictly regulated; typically real interest rates were negative; management of financial institutions was openly divided between the political parties, and political managers rationed credit to favored industries and borrowers. By the 1960s and 1970s the financial system more closly resembled to arrangements in the Third World than those in northwestern Europe. The mutual self-interest of leading political actors and pressure groups preserved the system.

The third phase came to an end in 1979 when the system practically self-destructed. A rapidly rising rate of inflation created double-digit negative real interest rates that reduced the demand for real deposits, slicing the banking system in half (measured by deposits). The political managers reacted by protecting their favorite customers, partly by substantially increasing foreign borrowing, but it soon became clear that the old system was untenable.

Repressed financial systems were a common phenomenon in the 20th century, especially among countries in the Third World. According to the Frasier Economic Freedom Index in 1980, toward the

[11] *See Thráinn Eggertsson and Tryggvi Thor Herbertsson (2005). "Evolution of Financial Institutions: Iceland's Path from Repression to Eruption," IoES Working Paper No. W05:10, University of Iceland (downloadable at www.ioes.hi.is).*

end of Iceland's period of financial repression, the country's credit market ranked number 62 of 102 markets in terms of liberalization. Iceland has now moved up dramatically, ranking 14 of 123 in terms of liberalization in 2002, with the most liberal being Hong Kong, and Myanmar the most regulated.[12]

The first step in the modern reform process was taken in 1979 when the authorities, while still controlling nominal interest rates, introduced general indexation of financial obligations, including bank deposits and bank loans. Financial indexation proved highly successful in gradually restoring the stock of financial saving.

The next major step was taken in 1984-1986 when government control of interest rates was abolished, which along with other forms of deregulation stimulated rapid development of markets for various types of securities. The Central Bank gradually reduced the reserve requirement ratios of the commercial banks from 28% in 1979 to 5% in 1992 (and to 2% in 2003). In the old system the Treasury met its financial needs through overdrafts with the Central Bank but a new policy in 1992 ended that practice.[13]

Privatization of the three commercial banks at the turn of this century marks the final important stage in the development of the Icelandic financial system. In this respect the timing is interesting. The process took place when long-term interest rates were historically low in the world (due to high savings in Asia and the oil producing countries, and decreasing tax rates in the industrialized countries), which in fact made transformation of the business sector in Iceland relatively easy and consequently created many new business opportunities for the banks.

The most unusual aspect of the reform process in Iceland is the extraordinary expansion of the banking system that has occurred since the reform process was completed (see Table 4). In the period from 1995 to 2004 the ratio of deposits to GNP had increased from 37% to 68%, and the bank lending/GNP ratio increased from 55% to 254%. *The Banker*, in a survey of the performance of the world's 1,000 largest banks in 2004, reported that the three Icelandic commercial banks are among the fastest growing banks in the world.

Total assets of the Icelandic banking system have grown from a little less than 60% of GDP in 1990 to more than 396% in 2005, which is high by any standard, but not out of line with small countries

[12] *James Gwartney and Robert Lawson (2005). Economic Freedom of the World: 2005 Annual Report, Fraiser Institute.*

[13] *Although this was done twice in the following years and finally became explicitly banned in the new Central Bank legislation in 2001.*

that have become international financial centers, such as Hong Kong, the Netherlands, and Switzerland (Table 4).

TABLE 4: TOTAL BANK ASSETS GDP RATIO

	1980*	1985	1990**	1995***	2000	2003	2004
Australia	na	na	na	1.29	1.57	1.62	1.78
Belgium	na	na	na	na	3.14	3.33	na
Canada	0.98	0.93	0.91	1.14	1.46	1.47	1.47
Chile	na	na	0.92	0.84	0.98	0.94	1.02
Czeck Rep.	na	na	na	1.33	1.34	1.02	0.96
Finland	na	na	na	na	na	1.11	1.23
France	na	na	na	2.22	2.43	2.54	na
Germany	na	na	na	na	3.03	3.04	3.02
Hong Kong	na	5.70	8.91	7.15	5.17	5.32	5.53
Hungary	na	na	na	0.69	0.64	0.73	0.77
Iceland	0.37	0.50	0.57	0.55	1.18	1.80	2.54
Italy	na	na	na	na	1.53	1.73	1.76
Japan	na	1.66	2.11	1.72	1.62	na	na
Malasia	na	na	na	2.03	1.92	2.07	1.94
Netherlands	na	na	na	na	4.03	4.26	4.44
Norway	na	na	0.85	0.76	0.91	1.10	1.07
Saudi Arabia	na	na	na	0.64	0.64	0.68	0.70
South Africa	na	na	0.77	0.73	0.92	1.14	na
Spain	na	na	na	na	1.84	2.02	2.05
Sweden	na	na	na	na	2.13	2.14	2.35
Switzerland	2.63	3.18	3.30	3.56	5.11	5.19	5.60
Thailand	na	na	na	na	1.27	1.15	1.11
UK	0.47	0.68	1.09	1.05	1.54	1.72	1.81
USA	0.57	0.58	0.57	0.57	0.62	0.67	0.68

Source: **BIS, unofficial statistics.**

To sum up, Iceland's path from repression to a modern market economy can be explained by general liberalization of the economy, privatization, globalization (the European Economic Area agreement), and well-educated young people who are often educated abroad and trained in a financial market that is disproportionate to the size of the country due to the extent of its pension

*Note: * 1981 for Canada and Iceland, ** 1991 for South Africa, *** 1996 for Malaysia, and 2001 for Sweden.*

wealth. The result has been a movement toward Iceland's becoming an international banking center (although on a small scale because the country is, after all, a microstate), where its banks perform financial intermediation, mostly outside of the country.

It is fairly obvious that the internalization of Icelandic financial institutions has changed the way they are financed (see Table 5). The total assets of the system were about 80% of GDP in 2000 but were more than four times GDP in 2006. A banking system that is only serving the local market can finance itself domestically. In early 2000 less than 1/3 of the financing came from abroad, while in 2006 almost 2/3 came from the international financial market.

TABLE 5: FINANCING OF THE BANKING SYSTEM

	Feb 2006		Feb 2005		Feb 2004		Feb 2003		Feb 2002		Feb 2001		Feb 2000	
Domestic liabilit.	**922,084**	**21%**	**708,727**	**30%**	**592,916**	**39%**	**499,577**	**47%**	**446,283**	**46%**	**360,057**	**46%**	**335,328**	**62%**
Deposits	654,152	15%	541,152	23%	468,258	31%	386,337	37%	343,896	36%	290,149	37%	260,827	48%
Bond issues	133,574	3%	98,950	4%	74,290	5%	80,541	8%	68,886	7%	51,004	7%	58,729	11%
Other borrowing	134,358	3%	68,625	3%	50,368	3%	32,699	3%	33,501	3%	18,904	2%	15,772	3%
Foreign liabilities	**2,589,534**	**60%**	**1,213,549**	**52%**	**709,588**	**47%**	**454,145**	**43%**	**427,609**	**44%**	**357,988**	**46%**	**156,069**	29%
Deposits	135,375	3%	11,685	0%	6,155	0%	0	0%	0	0%	0	0%	0	0%
Bond issues	1,954,724	45%	956,506	41%	529,148	35%	214,839	20%	201,534	21%	124,096	16%	156,069	0%
Direct lending	499,436	12%	245,358	10%	174,285	12%	239,306	23%	226,075	24%	233,892	30%	52,573	29%
Capital & subord.	**670,104**	**16%**	**395,700**	**17%**	**170,749**	**11%**	**127,446**	**12%**	**111,341**	**12%**	**76,869**	**10%**	**52,573**	**10%**
Other items	**114,763**	**3%**	**21,923**	**1%**	**39,260**	**3%**	**-27,104**	**-3%**	**-23,749**	**-2%**	**-19,249**	**-2%**	**-3,643**	**-1%**
Total	**4,296,485**	**100%**	**2,339,899**	**100%**	**1,512,513**	**100%**	**1,054,064**	**100%**	**961,484**	**100%**	**775,665**	**100%**	**540,327**	**100%**

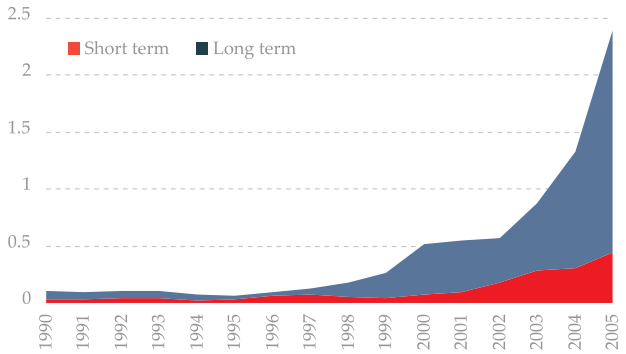
Source: **Central Bank of Iceland**

Almost half of the financing came out of domestic deposits in 2000 but only about 15% in 2006. At the same time, deposits grew from 38% of GDP in 2000 to 65% in 2006. This illustrates that the Icelandic banking system has changed from a system of local depositary institutions to an international financial intermediator in only five years.

In 2000 the external debt of the banks was a little more than 50% of GDP but almost 240% in 2005 (see Figure 13). Until recently the banks operated almost solely in the small domestic Icelandic market. As global liquidity has increased, and Icelandic entrepreneurs have started to make use of historically low interest rates to acquire businesses outside Iceland, the banks have followed. Assets of the banking system abroad have consequently increased (see Figure 14).

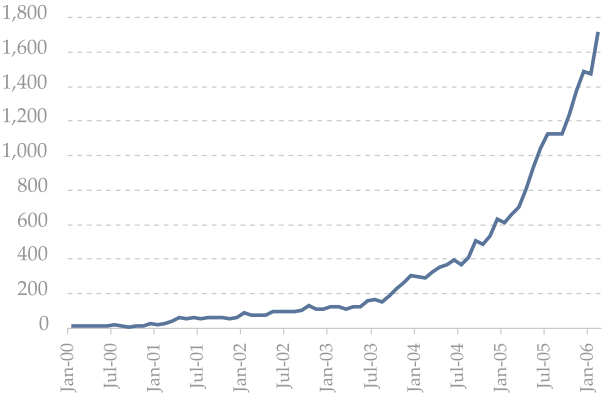
The growth in assets abroad February 2005 to February 2006, is 160% from 661 bISK to 1,719 bISK, almost double the country's GDP. Foreign lending has also increased considerably (see Figure 15).

FIGURE 13:
EXTERNAL DEBT OF THE BANKING SYSTEM GDP RATIO



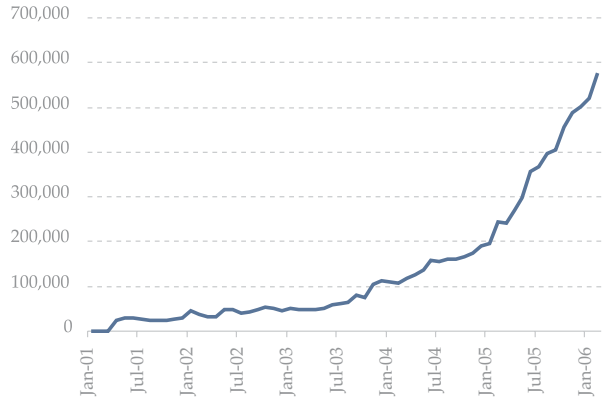
Source: Central Bank of Iceland

FIGURE 14:
FOREIGN ASSETS OF THE BANKING SYSTEM, bISK.



Source: Central Bank of Iceland

FIGURE 15:
FOREIGN LENDING, bISK



Source: Central Bank of Iceland

CHAPTER 2

UNDERSTANDING FINANCIAL INSTABILITY

Recent reports by research departments of international banks on the Icelandic economy have raised the specter of a possible financial meltdown, and they see possible parallels between Iceland's economic situation and that of emerging market countries, such as Thailand, which experienced financial crises in the late 1990s.[14] *In order to evaluate whether Iceland's economy is financially fragile, we need to step back a bit and examine what economic analysis tells us about the sources of financial instability. Then we can ask whether the conditions that led to financial instability elsewhere are also present in Iceland.*

2.1 WHAT IS FINANCIAL INSTABILITY?

A financial system performs the essential function of channelling funds to those individuals or firms with productive investment opportunities. To do this well, participants in financial markets must be able to make accurate judgments about which investment opportunities are more or less creditworthy. Thus, a financial system must confront problems of asymmetric information, in which one party to a financial contract has much less accurate information than the other party. For example, borrowers who take out loans usually have better information about the potential returns and risk associated with the investment projects they plan to undertake than lenders do. Asymmetric information leads to two basic problems in the financial system (and elsewhere): adverse selection and moral hazard.

Adverse selection occurs before the financial transaction takes place, when potential bad credit risks are the ones most actively seeking loans. For example, those wanting to take on big risks are likely to be the most eager to take out a loan, even at a high rate of interest, because they are less concerned with paying the loan back. Thus, the lender must be concerned that the parties most likely to produce an undesirable or adverse outcome are also most likely to be selected as borrowers. Lenders will try to tackle the problem posed by asymmetric information by screening out bad from good credit risks. But this process is inevitably imperfect, and fear of adverse selection, particularly

[14] *See, i.g., Den Danske Bank, Iceland: Geyser Crisis, March 21st 2006,.*

if it is harder to get information about potential borrowers, will lead lenders to reduce the quantity of loans they might otherwise make.

Moral hazard occurs after the transaction takes place. It occurs because a borrower has incentives to engage in risky activities that are undesirable from the lender's point of view because they decrease the likelihood that the loan will be paid back. Higher risk activities, if they pay off, produce high returns for the borrower, but if they fail, the lender bears most of the loss. Lenders often impose restrictions (restrictive covenants) on borrowers so that borrowers do not engage in behavior making it less likely that they can pay back the loan. However, such restrictions are costly to enforce and monitor, particularly when information is harder to collect, again leading lenders to reduce the amount of lending they might otherwise make.

The asymmetric information problems described above provide a definition of what financial instability is:[15]

> *Financial instability occurs when there is a disruption to financial markets in which asymmetric information and hence adverse selection and moral hazard problems become much worse, so that financial markets are unable to channel funds efficiently to those with the most productive investment opportunities.*

Financial instability thus results in the inability of financial markets to function efficiently, which can lead to a sharp contraction in economic activity.

2.2 WHAT CAUSES FINANCIAL INSTABILITY TO OCCUR?

Although there can be general increases in uncertainty making it harder to collect information in financial markets and thus leading to increases in adverse selection and moral hazard problems, the main source of financial instability is deterioration in balance sheets, both in the financial and the non-financial sectors.

Deterioration in Bank Balance Sheets

The literature on asymmetric information and financial structure explains why financial intermediaries (commercial banks, thrift institutions, finance companies, insurance companies, mutual funds and pension funds), play such an important role in the financial system.[16] They have

[15] *Mishkin, Frederic S. (1996). "Understanding Financial Crises: A Developing Country Perspective," Annual World Bank Conference on Development Economics, pp. 29-62.*

both the ability and the economic incentive to address asymmetric information problems. For example, banks have an obvious ability to collect information at the time they consider making a loan, and this ability is only increased when banks engage in long-term customer relationships and a line of credit arrangements. In addition, their ability to scrutinize the checking account balances of their borrowers provides banks with an additional advantage in monitoring the borrowers' behavior. Banks also have advantages in reducing moral hazard;[17] they can engage in lower cost monitoring than individuals, and they have advantages in preventing risk taking by borrowers since they can use the threat of cutting off lending in the future to improve a borrower's behavior.[18] Banks' natural advantages in collecting information and reducing moral hazard explain why banks have such an important role in financial markets throughout the world.

The special importance of banks and other financial intermediaries in the financial system implies that if their ability to lend is impaired, overall lending will decline and the economy will contract. If banks (and other financial intermediaries making loans) suffer deterioration in their balance sheets, and so have substantial contraction in their capital, they have two choices: they can either cut back on their lending or try to raise new capital. However, when these institutions experience deterioration in their balance sheets, it is very hard for them to raise new capital at a reasonable cost. Thus, the typical response of financial institutions to weakened balance sheets is a contraction in their lending, which slows economic activity.

If the deterioration in bank balance sheets is severe enough, it can even lead to bank panics, in which there are multiple, simultaneous failures of banking institutions. Indeed, in the absence of a government safety net, there is some risk that contagion can spread from one bank failure to another, causing even healthy banks to fail. The source of the contagion is again asymmetric information. In a panic, depositors, fearing the safety of their deposits and not knowing the quality of the banks' loan portfolios, withdraw their deposits from the banking system, causing a contraction in loans and a multiple contraction in deposits, which then causes other banks to fail. In turn, the failure of a bank means the loss of the information relationships in which that bank participated, and thus a direct loss in the amount of financial intermediation that can be done by the

16 *See Mark Gertler (1988). "Financial Structure and Aggregate Economic Activity: An Overview," Journal of Money Credit and Banking 20, Part 2, pp. 559-88, and Ben S. Bernanke, Mark Gertler, and Simon Gilchrist (1998). "The Financial Accelerator in a Quantitative Business Cycle Framework," in John Taylor and Michael Woodford (1999), editors, Handbook of Macroeconomics, Amsterdam: North Holland, for excellent surveys.*

17 *Douglas Diamond (1984). "Financial Intermediation and Delegated Monitoring," Review of Economic Studies 51, pp. 393-414.*

18 *Joseph E. Stiglitz and Andrew Weiss (1983). "Incentive Effects of Terminations: Applications to Credit and Labor markets," American Economic Review 73, pp. 912-27.*

banking sector. The outcome is an even sharper decline in lending to facilitate productive investments, with an additional resulting contraction in economic activity.

Deterioration of Non-financial Balance Sheets

If there is a widespread deterioration of balance sheets among non-financial borrowers, it worsens both adverse selection and moral hazard problems in financial markets, thus promoting financial instability. This problem can arise in a variety of ways.

For example, lenders often use collateral as an important way of addressing asymmetric information problems. Collateral reduces the consequences of adverse selection or moral hazard because it reduces the lender's losses in the case of a default. If a borrower defaults on a loan, the lender can sell the collateral to make up for at least some of the losses on the loan. But if asset prices in an economy fall, and the value of collateral falls as well, then the problems of asymmetric information suddenly increases.

Net worth can perform a similar role to collateral. If a firm has high net worth, then even if it defaults on its debt payments, the lender can take title to the firm's net worth, sell it off, and use the proceeds to recoup some of the losses from the loan. High net worth also directly decreases the incentives for borrowers to commit moral hazard because borrowers now have more at stake, and thus more to lose, if they default on their loans. The importance of net worth explains why stock market crashes can cause financial instability. A sharp decline in the stock market reduces the market valuation of a firms' net worth, and thus can increase adverse selection and moral hazard problems in financial markets.[19] Since the stock market decline reducing net worth increases incentives for borrowers to engage in moral hazard, and since lenders are now less protected against the consequences of adverse selection because the value of net assets is worth less, lending decreases and economic activity declines.

The Role of Currency Crises in Balance Sheet Deterioration

A prominent feature of recent episodes of financial crises is that they have been triggered by a collapse of the domestic currency. But not all currency crises lead to financial instability. For example, the successful attack on the British pound in the ERM currency crisis of September 1992 did not lead to financial instability in the United Kingdom. Indeed, the resulting currency

[19] *See Ben S. Bernanke and Mark Gertler (1989). "Agency Costs, Collateral, and Business Fluctuations," American Economic Review 79, pp. 14-31 and Charles W. Calomiris and R. Glenn Hubbard (1990). "Firm Heterogeneity, Internal Finance, and Credit Rationing," Economic Journal 100, pp. 90-104.*

depreciation ended up stimulating the UK economy because it made British goods cheaper internationally, which increased the demand for British goods and services and promoted an expansion in the British economy. This was also the case in Iceland in 2001. Although the ISK depreciated dramatically, the health of the financial system remained strong. On the other hand, currency crises in emerging market countries have been accompanied by full-scale financial crises, a phenomenon that is referred to as "twin crises".[20] Currency crises in these countries result in financial instability because they produce a sharp deterioration in balance sheets.

A key characteristic distinguishing emerging market economies from advanced economies like Iceland's is the structure of their debt markets. In advanced economies inflation has tended to be moderate, and so debt contracts are typically of fairly long duration, with fixed nominal interest rates. In contrast, emerging market countries have experienced very high and variable inflation rates in the past, with accompanying wide swings in the value of the domestic currency. One result of their experience is that debt contracts are of very short duration in order to minimize the inflation risk. In many emerging market countries, for example, almost all bank lending is very short-term, with variable rate contracts that are adjusted on a monthly, or sometimes daily basis. In addition, because of the likelihood that their currency's value will change for the worse, many non-financial firms, banks and governments in emerging market countries find it much easier to issue debt denominated in foreign currencies, often US dollars.[21] This phenomenon is called liability dollarization although other foreign currencies besides dollars are used to denominate debt. In comparison, less than 5% of household debt in Iceland is foreign currency denominated and more than 85% of the debt stock is long-term (duration of the stock more than 30 years). Also, more than 70% of loans to companies are with natural or derivative hedges as we will see in the next Section.

When debt contracts are denominated in foreign currency, and there is an unanticipated depreciation or devaluation of the domestic currency, the debt burden of domestic firms increases in terms of domestic currency because it takes more domestic currency to pay back the dollarized debt. If the goods and services produced by most firms are priced in the domestic currency, the firms' assets do not rise in value in terms of domestic currency, while the debt does. The depreciation of the domestic currency then increases the value of debt relative to assets, and the firm's net worth declines. The decline in net worth then increases adverse selection and moral

[20] *See Graciela L. Kaminsky and Carmen M. Reinhart (1999). "The Twin Crises: The Causes of Banking and Balance-of-Payments Problems," American Economic Review 89, pp. 473-500.*

[21] *Barry Eichengreen and Ricardo Hausmann (1999). "Exchange Rates and Financial Fragility," in New Challenges for Monetary Policy, Kansas City, Mo.: Federal Reserve Bank of Kansas City, pp. 329-368.*

hazard problems described earlier, which lead, in turn, to a decline in investment and economic activity.

For firms exporting most of their output (generally priced in foreign currency), the impact of depreciation on the balance sheet is, however, far less severe when they have foreign-denominated debt because it is in effect hedged. The depreciation leads to a rise in the prices of the goods and services the exporter produces, thereby raising the value of its assets in terms of the domestic currency. The increase in asset values helps to offset the rise in the value of the exporter's debt. This outcome suggests that when the export sector in an emerging market economy is large, the consequences of a currency collapse on balance sheets and the overall economy will be less severe, and this is what empirical evidence finds.[22]

Although depreciation in an emerging market country under a floating exchange-rate regime can lead to financial fragility, it is less likely than a pegged exchange rate regime to cause a full-fledged financial crisis in which financial markets seize up and stop performing their role of moving funds to those with productive investment opportunities. First, a floating exchange-rate regime makes currency risk clearer so that firms, both financial and non-financial, are more likely to hedge against this currency risk. Second, in contrast to a floating exchange rate regime, when a successful speculative attack occurs against a pegged exchange-rate regime, the decline in the value of the domestic currency is usually much larger, more rapid and more unanticipated than when depreciation occurs under a floating exchange-rate regime.[23] For example, during the East Asian crisis in 1997, currencies fell by 50%, with the worst hit country Indonesia seeing its currency decline by 75% in a very short period.

In addition, a pegged exchange rate regime encourages unhedged liability dollarization which makes the financial system more vulnerable when depreciation occurs: domestic firms whose output is denominated in the local currency are more likely to borrow in foreign currency because the government's commitment to preventing a decline in the value of the domestic currency reduces their risk. With a guarantee that the local currency will remain fixed in terms of foreign currency, the domestic firm does not have to worry that the local currency will depreciate, which would require the firm to pony up more of its local currency to pay back foreign-currency debt.[24]

[22] *Guillermo A. Calvo, Alejandro Izquierdo, and Ernesto Talvi (2003). "Sudden Stops, the Real Exchange Rate, and Fiscal Sustainability: Argentina's Lessons," NBER Working Paper 9828 (July) and Jeffrey Frankel (2005). "Contractionary Currency Crashes in Developing Countries," NBER Working Paper 11508, (July).*

[23] *Frederic S. Mishkin (1998). "The Dangers of Exchange Rate Pegging in Emerging-Market Countries," International Finance 1, No. 1 (October), pp. 81-101.*

The dangers of a pegged exchange-rate regime prompted Stanley Fischer, the first deputy managing director of the IMF, to state:[25]

> *Each of the major international capital market-related crises since 1994 - Mexico in 1994, Thailand, Indonesia and Korea in 1997, Russia and Brazil in 1998, and Argentina and Turkey in 2000 - has in some way involved a fixed or pegged exchange rate regime. At the same time, countries that did not have pegged rates - among them South Africa, Israel in 1998, Mexico in 1998 - avoided crises of the type that afflicted emerging market countries with pegged rates.*

Fischer even went so far as to declare that adoption of a flexible exchange rate system is the most important preventitive measure an emerging market can take against crises.

2.3 ROUTES TO FINANCIAL INSTABILITY

Now that we understand what causes financial instability, we can examine the routes through which it occurs so that we can see if what is happening in Iceland currently suggests that financial instability is a potential problem. There are three basic routes to financial instability: 1) financial liberalization with inadequate prudential regulation and supervision, 2) severe fiscal imbalances, and 3) imprudent monetary policy. We examine each of these in turn.[26]

Financial Liberalization with Weak Prudential Regulation and Supervision

The seeds of financial instability are often sown when countries liberalize their financial systems, usually several years before the crisis hits. Eighteen of twenty-six crises in the last twenty years occurred after the financial sector had been liberalized, both internally and externally, in the preceding five years.[27]

With internal restrictions lifted, banks go on a lending spree and expand their lending by 15 to 30% per year, which is more than double the typical lending growth rate.[28] The lending boom can be

[24] *Eduardo Levy-Yeyati (2003). "Financial Dollarization: Where Do We Stand?," paper presented at the IDB/World Bank Conference, Financial Dedollarization: Policy Options, December 1-2, Washington, D.C. and Christian Broda and Eduardo Levy-Yeyati (2003). "Endogenous Deposit Dollarization," Federal Reserve Bank of New York Staff Reports 60.*

[25] *Stanley Fischer (2001). "Exchange Rate Regimes: Is the Bipolar View Correct?" Journal of Economic Perspectives 15, No. 2 (Spring), pp. 3-24.*

[26] *For a detailed discussion of how financial instability can develop, see Frederic S. Mishkin (2006). The Next Great Globalization: How Disadvantaged Nations Can Harness Their Financial Systems to Get Rich, Princeton, NJ: Princeton University Press (forthcoming).*

[27] *Graciela L. Kaminsky and Carmen M. Reinhart (1999). "The Twin Crises: The Causes of Banking and Balance-of-Payments Problems," American Economic Review 89, No. 3, pp. 473-500, Glick, Reuven and Michael Hutchison (1999). "Banking and Currency Crises: How Common as Twins," in Reuven Glick, F. Moreno and M. Spiegel, eds., Financial Crises in Emerging Market Countries (New York: Cambridge), Asli Demirguc-Kunt and Detragiarche Enrica (1998). "The Determinants of Banking Crises: Evidence from Developed and Developing Countries." IMF Staff Papers, 45(1), pp. 81-109 and John Williamson and M. Mahar (1998). A Survey of Financial Liberalization, Princeton Essays in International Finance 211, Princeton, N.J.: Princeton University.*

exacerbated by capital inflows, which adds fuel to the fire. Not only do banks increase their lending, they give out more loans to firms in industries about which they have little knowledge. Because the managers of the banking institutions in emerging market countries typically do not have the required expertise to manage risk appropriately in these new lines of business and are unable to cope with the rapid growth of lending typically following financial liberalization, problems are bound to arise. Even if the required managerial expertise is available initially, the rapid lending growth would likely outstrip the information resources available to banking institutions. Increased lending to industries about which banks know little results in excessive risk taking on the banks' part.

Because of this lack of expertise in screening and monitoring borrowers, losses on the loans begin to mount, driving down the net worth (capital) of the bank. With less capital, banks become riskier, and so depositors and other potential lenders to the banks are less willing to supply them with funds. Fewer funds then mean fewer loans and lending. The lending boom will turn into a lending crash.

The lending boom is also exacerbated by the presence of a government safety net for the banking system which is present in some form in all countries. If depositors and other providers of funds to banks are protected from losses, they will keep on supplying banks with funds so banks can continue to lend and will not fail. This is the good news. The bad news is that the government safety net weakens market discipline for the bank because with a safety net, depositors know that they will not lose anything if a bank fails, and so the bank can still acquire funds even if it takes on excessive risk. The government safety net increases the moral hazard incentive for banks to take on greater risk than they otherwise would, because if their risky, but high interest loans, pay off, the banks make a lot of money; if they don not and the bank fails, taxpayers pay most of the bill for the safety net protecting the banks' depositors. In other words, banks can play the game of "heads, I win: tails, the taxpayer loses".

The moral hazard incentives to take on excessive risk arising from the government safety net are most likely to be a source of bad loans than bank managers' lack of expertise. Even in countries with well-developed banking sectors, financial liberalization has often led to lending booms and banking crises, as the experience in the 1980s and 1990s in Japan, the United States and Scandinavia

[28] *Frederic S. Mishkin (1999). "Global Financial Instability: Framework, Events, Issues," Journal of Economic Perspectives, Fall, 13 (4): pp. 3-20.*

suggests. A government safety net has the unintended consequence of making it more likely that a lending boom will occur, followed by an economic bust, and this is exactly what happened in East Asia.[29]

A solution preventing a lending boom and bust is prudential regulation and supervision of the banking system to prevent banks from taking on excessive risk.[30] However, financial liberalization is often undertaken with completely inadequate prudential regulation and supervision. This is not an accident. In countries with weak institutional frameworks (endemic corruption and a weak free press that has little incentive to keep politicians honest), powerful business interests that own banks are able to prevent the bank supervisors from doing their job properly. They are often able to persuade politicians to weaken regulations restricting their banks from engaging in high risk/high payoff strategies. After all, if bank owners can go for growth and expand bank lending rapidly, they stand to make a fortune. But, if the bank gets in trouble, the government is likely to bail it out, and the taxpayer foots the bill. In addition, these business interests can also make sure that the supervisory agencies are starved for resources, so that even in the presence of tough regulations, the supervisory agency does not have the capability to effectively monitor banking institutions or to close them down.

The deterioration in bank balance sheets triggers currency crises because when banks and other financial institutions are in trouble, it is not as easy for governments to defend their currencies by raising interest rates and thus encourage capital inflows. If the government raises interest rates, banks must pay more to obtain funds. This increase in costs decreases bank profitability, which may lead them to insolvency. Thus, when the banking system is in trouble, the government and Central Bank are now between a rock and a hard place: If they raise interest rates too much, they will destroy their already weakened banks, and if they don not they cannot maintain the value of their currency.

Once speculators in the market for foreign currency recognize the troubles in a country's financial sector and realize that the government's ability to defend the currency is limited, they know that they are presented with an almost sure-thing bet because the currency has only one way to go, downward in value. Speculators engage in a feeding frenzy and sell the currency in anticipation

29 Paul Krugman (1998). "What Happened to Asia?" MIT mimeo and Michael Dooley (2000). "A Model of Crises in Emerging Markets," Economic Journal 110, No. 1, pp. 256-72.

30 In contrast to the East Asian countries that suffered crises in the late 1990s, Singapore, Hong Kong, and Taiwan all had strong prudential regulatory and supervisory systems and avoided the crises that engulfed their neighbors.

of its decline, which will provide them with huge profits. These sales rapidly use up the country's holdings of reserves of foreign currency because it has to sell its reserves to buy the domestic currency and keep it from falling in value. Once the country's central bank has exhausted its holdings of foreign currency reserves, the jig is up. It no longer has the resources to intervene in the foreign exchange market and must let the value of the domestic currency fall: that is, the government must allow a devaluation.

Now depreciation of the currency tips the economy over into a full-fledged financial crisis because it increases the value of debt relative to assets, with the result that firms' balance sheets deteriorate sharply, leading to increased adverse selection and moral hazard problems, which lead, in turn, to a decline in investment and economic activity. To see how the currency crisis destroys balance sheets and provokes a financial crisis, we can look at what happened in Indonesia after its 1997, currency crisis during which the rupiah's value fell by 75% and dollar-denominated debt became four times as expensive in terms of rupiah. In this situation, almost every Indonesian firm with a substantial amount of dollar debt became insolvent. The moral hazard and adverse selection problems of lending to an insolvent firm were so severe that even if an Indonesian firm in this situation initially had a strong balance sheet, was run well, and had superb investment opportunities, no one would lend to it. Investment and spending collapsed as did the entire economy: output declined by over 10% in 1998 (larger than the decline the United States experienced in the first year of the Great Depression), and the percent of the population living in poverty doubled.

Severe Fiscal Imbalances

The second route through which countries end up experiencing a financial crisis is through government fiscal imbalances entailing substantial budget deficits that need to be financed. The recent financial crisis in Argentina in 2001-2002 is of this type, but other recent crises, for example, in Russia in 1998, Ecuador in 1999, and Turkey in 2001 also have some elements of this type of crisis.[31]

In contrast to Mexico and the East Asian crisis countries, Argentina had a well-supervised banking system, and a lending boom did not occur before the crisis. Thus, the banks were in surprisingly good shape before the crisis, even though a severe recession had begun in 1998. This recession led

[31] *Although Brazil underwent a fiscal and currency crisis in 1999 and another currency crisis in the run-up to the election of Lula in 2002, it did not undergo a financial crisis because its banking system was hedged against foreign exchange rate risk, in contrast to the other emerging market countries discussed here.*

to declining tax revenue and a widening gap between expenditures and taxes. The subsequent severe fiscal imbalances (budget deficits) were so large that the government had trouble getting both domestic residents and foreigners to buy enough of its bonds. It then had to look for other sources to finance its deficits.

When governments face large fiscal imbalances and cannot finance their debt, they often cajole or force banks to purchase government debt. This is exactly what the Argentine government did in the run-up to its financial crisis in 2001. When investors lose confidence in the ability of the government to repay this debt, they unload government bonds, which causes their prices to plummet. Now the banks that are holding this debt have a big hole on the asset side of their balance sheets, with a huge decline in their net worth. The deterioration in bank balance sheets then causes a decline in bank lending and can even lead to a bank panic, and this is exactly what happened in Argentina. Severe fiscal imbalances spill over into and weaken the banking system, which leads to a worsening of adverse selection and moral hazard problems, which, in turn, cause an economic contraction.

We have seen that severe fiscal imbalances, as in Argentina, can lead to a deterioration in bank balance sheets, and so can help produce a currency crisis and financial crisis along the lines described above. Fiscal imbalances can also directly trigger a currency/financial crisis. When government budget deficits spin out of control, foreign and domestic investors begin to suspect that the country may not be able to pay back its government debt and so will start pulling money out of the country and selling the domestic currency. Recognition that the fiscal situation is out of control thus results in a speculative attack against the currency, which eventually results in its collapse, as occurred in Argentina on January 6, 2002. Then the depreciation of the currency destroys balance sheets, particularly if there is extensive liability dollarization, as there was in Argentina, triggering a financial crisis and a great depression.

Imprudent Monetary Policy

Monetary policy which produces episodes of high inflation can also promote financial instability. When countries have a past history of high inflation, debt contracts are often denominated in foreign currencies, and this liability dollarization makes the financial system more fragile because currency depreciation is then likely to trigger a financial crisis.[32]

[31] *G. De Nicolo, Patrick Honohan, and Alain Ize (2003). "Dollarization of the Banking System: Good or Bad?" IMF Working Paper 03/146 (July) and Inter-American Development Bank, Unlocking Credit: The Quest for Deep and Stable Bank Lending, 2005 Report, Economic and Social Progress in Latin America (Wash. D.C.: Inter-American Development Bank and Johns Hopkins University Press, 2005).*

Furthermore, a weakening of the credibility of the monetary authorities to keep inflation under control can lead to depreciation of the currency which leads to a destruction of balance sheets and financial instability. Indeed, we saw this scenario played out in Argentina when Domingo Cavallo, who was appointed as the economy minister in March 2001, used his special powers to revise the charter of the Banco Central de Republica Argentina to remove limits on the ability of the central bank to inject liquidity into the economy. This allowed the central bank, which was effectively controlled by the government after its respected president Pedro Pou was forced to resign, to pursue discretionary expansionary policy, which it eventually did. These actions compromised the independence of the Banco Central de Republica Argentina, weakened its credibility and opened the door for expansionary monetary policy that would help bring the currency board down.

CHAPTER 3

IS ICELAND GOING DOWN TRADITONAL ROUTES TO FINANCIAL INSTABILITY?

Armed with an economic analysis of financial instability from the last chapter and the overview of the Icelandic economy in the first, we can ask if the current situation in Iceland suggests that it might be headed for the type of instability experienced by other countries in recent years.

3.1 FINANCIAL LIBERALIZATION WITH WEAK PRUDENTIAL REGULATION AND SUPERVISION?

Financial instability often follows financial liberalization, but financial instability almost always manifests itself within five or so years of the financial liberalization. As our overview of the Icelandic economy indicates, financial liberalization began in earnest in the 1980s and was mostly complete by 1995, over a decade ago. Banks have therefore had more than sufficient time to develop the expertise to manage risk appropriately in the new lines of business that are opened up by financial liberalization. Having stated this, one has to be cautious and discuss the possible dangers from the credit boom in Iceland in recent years, as we will do later in this section.

Financial instability also results from inadequate regulation and supervision of the financial system, often resulting from a weak institutional framework, making it unlikely that bank supervisors will be able to impose the appropriate oversight of the financial system so that it avoids taking on excessive risk. Iceland, however, has excellent institutions: indeed, as we have seen, the quality of its beaurocracy and low levels of corruption, rank it among the best-run countries in the world as we saw in the overview chapter. In contrast to the inadequate prudential supervision in countries that have experienced financial instability, Iceland's prudential supervisors are seen as honest and competent. Their statements that the banking system in Iceland is safe and sound should be taken at face value. In the last annual report of the Financial Supervisory Authority (FSA), recognized that the credit expansion is a source of risk, and that the internationalization of the Icelandic banks will create challenges for the authority.[33] The rapid growth in foreign operations means new risks and

[33] *See www.fme.is*

calls for more complex and more robust risk management than before. At the same time, the FSA has noted the strong capital position of the banks, and that they are well equipped to meet potential challenges.

Another factor that can lead to financial instability is a large amount of unhedged liability dollarization: in other words, a large amount of foreign denominated debt that is lent to businesses whose cash flow, and hence assets are priced in local currency. It is certainly true that Iceland's banks have an enormous amount of liabilities denominated in foreign currency relative to the size of Iceland's economy, close to 250% of GDP (Figure 13).

As the Icelandic banking system has become more international, new risks have surfaced. One key issue is how vulnerable the banks are to large swings in the domestic currency. The direct exposure of the banks to risk associated with depreciation of the currency is minimal as foreign assets and liability must more or less match by law. The foreign currency assets of the banks (spot, forwards, and options) at the end of March 2006 were approximately 5,103 bISK, but liabilities were 5,005 bISK, leaving a positive net position in foreign currency of approximately 100 bISK, or 19.2% of the banks' total net assets. The liabilities are thus hedged fully for currency risks and a considerable chunk of net assets of the banks.

A natural question to ask now is how vulnerable the credit stock is for currency depreciations. How common is it for firms and households to have foreign currency dominated debt but income in ISK leaving them vulnerable for sudden drops in the ISK?

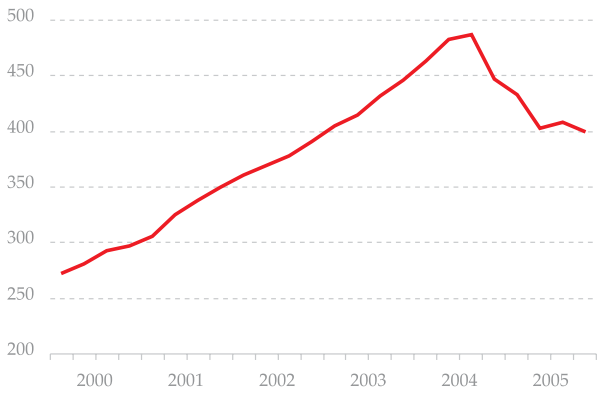
Households

The total debt of households to the credit system, year-end 2005, was 1,082 bISK, just over 100% of GDP (Figure 16). Of this a little more than 540 bISK was owed to the banks, while the remainder was owed to the Housing Finance Fund (HFF), the Student Loan Fund, the Pension funds, etc. The loans from the funds are all long-term and indexed; in fact most household debt is indexed with fixed interest rates (over 85%). The inflation component of the interest rates is spread over the entire maturity of the loan, and thus it insulates households from fluctuations in nominal interest rates. This is positive from a financial stability perspective but negative from a price stability (monetary policy) perspective.

Figure 16 shows that the majority of households' debt (around 75%) was to other parts of the credit system rather than the banks until the third quarter of 2004. In August 2004 banks went into the

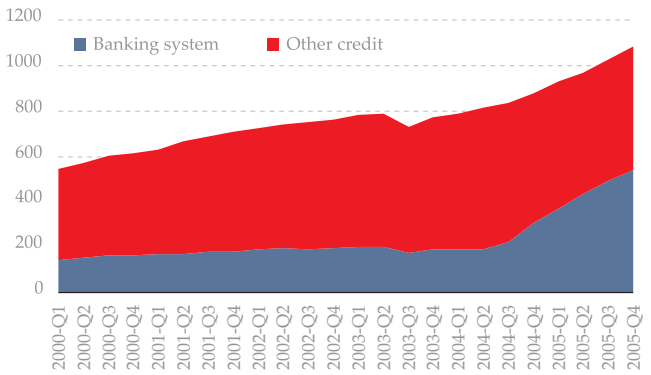
mortgage market offering fixed-rate indexed loans of up to 40 years with rates about 100 basis points lower (4.15% real) than the state-run HFF was offering. Moreover, the banks had no maximum on the loans, while the HFF had been limiting the maximum to 65% of the market value of the residential property or up to ISK 9.2 million. Needless to say, many borrowers used the opportunity, refinanced their mortgages and moved their business from the HFF to the banks (see Figure 16). As Figure 17 shows, household debt to the credit system moved to the banks from other parts of the system, most notably from the HFF. In only 15 months banks' financing of total debt of households changed from being about 25% of the total stock to 50%, and the debt increased by almost 250 bISK, most of it mortgages.

FIGURE 16:
LENDING OF THE HOUSING FINANCE FUND, bISK



Source: Central Bank of Iceland

FIGURE 17:
HOUSEHOLD BORROWING FROM THE CREDIT SYSTEM, bISK



Source: Central Bank of Iceland

Despite a rise in total household debt in recent years, debt service as a percentage of disposable income has not risen since 2000. This is due to disposable income rising dramatically and the duration of the total outstanding loan stock increasing by about four years since June 2004.

Furthermore, average interest rates have fallen by about 150 basis points on fixed-rate indexed mortgages and most of the high-interest-bearing, short-term debt has been refinanced since the banks started actively in the mortgages market in autumn 2004. Households are thus basically at the same starting point as in 2000 in terms of debt service ratio. A fall in the ISK would of course result in inflation hikes, but that would not lead to an excessive debt service burden as loans are indexed and bear fixed real rates. A rule of thumb is that a 10% lasting depreciation increases inflation by 3.5% and debt service approximately in the same proportion. Loan-to-value ratio for new bank mortgages has been 70% on average, but due to increases in real estate prices the current loan-to-value ratio is estimated at 61%. The mortgage collateral coverage of credit institutions is thus high, which should enable them to withstand substantial price changes.[34] Furthermore, only about 4% of households have foreign currency dominated loans amounting to less than 5% of the total household debt stock in 2004. In conclusion, a fall in the ISK is likely to increase household credit risks for the banking system, but only marginally. There is actually an upside for the banks from a fall in the ISK. As most of the debt is indexed, but liabilities only to a smaller extent, an inflation spike would thus benefit the banks.

Firms

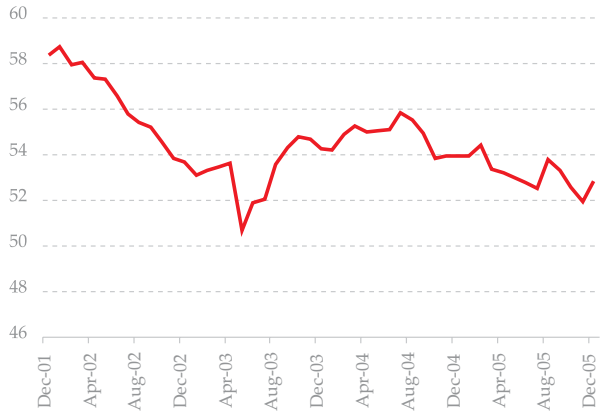
Industries' debt to the credit system stood at 2,172 bISK at the end of 2005 an increase of 49% year-on-year. Most of the increase occurred in the banking system. Around 52% of the banking system's corporate lendings of is foreign currency dominated, down from 58% in 2000 (see Figure 18). About 77% of the income of the 15 companies making up the ICEX-15 stock index is generated abroad. About 33% of their income is in British pounds, 24% in euros, 23% in ISK, 11% in US dollars, and 9% in other currencies. It is interesting that as the currency depreciates, the value of companies on the Iceland Stock Exchange in ISK increases as most of their income is in foreign currency. Almost 100% of the fish and fish processing firms have their income in foreign currency, almost 100% of the tourist industry, and 100% of the metal industry. Landsbanki has estimated that 73% of banks' foreign currency lending is to foreign companies and domestic companies with natural or derivative hedges. It thus appears that risks for the banking system from depreciation effects of the ISK are moderate.

Balance sheets of both firms and households in Iceland appear to be quite well insulated from exchange rate shocks. The floating exchange rate regime in Iceland also means that the risks from

[34] *Source: Landsbanki, research department.*

currency movements are well recognized by both the banks and bank supervisors. Indeed, the supervisors have put the top three Icelandic banks through stress tests to see if they can withstand major shocks.

FIGURE 18:
SHARE OF FOREIGN CURRENCY DENOMINATED CORPORATE DEBT, %



Source: Central Bank of Iceland

The stress test is such that the banks must be in a position to face setbacks that may simultaneously lead to 20% reduction in value of non-performing loans and appropriated assets, a 25% reduction in value of foreign shares of the bank, a 35% reduction in the value of domestic shares of the bank, a 7% reduction in value of bonds owned by the bank, and a 20% weakening of the ISK. If a bank fails to meet the criteria, the FSA may request a minimum capital adequacy ratio above 8% for the undertaking in question. Prior to taking such a decision, the supervisor is required to initiate talks with the board and management of the institution in question on its risk measurement methods and capital position and the action intended on behalf of the management in order to meet the statutory minimum requirements. A recent stress test by the FSA shows a need to increase the minimum capital adequacy ratio to approximately 10-11.5% in a worst-case scenario. This is below the current capital adequacy ratio of the Icelandic banks, which is 15.7% for Landsbanki, 14.6% for Glitnir, and 11.8% for Kaupthing Bank. The test is done on a regular basis, and risks measured on this scale seem to have been fairly constant in recent years. Furthermore, the capital adequacy ratios of the banks have recently increased substantially (see Table 4).

3.2 SEVERE FISCAL IMBALANCES?

Fiscal imbalances are not a problem in Iceland. Indeed, the case is quite the opposite. As discussed in Section 1.3, the fiscal situation in Iceland is one of the strongest in the world. Not only is net government debt, relative to GDP, less than 10%, but in contrast to many other countries, Iceland

has a fully funded pension system. The United States, Japan and the countries in the European Union would all love to be in Iceland's shoes.

3.3 IMPRUDENT MONETARY POLICY?

Monetary policy has also been quite good in Iceland in recent years. Since 2001 Iceland has been operating under an inflation-targeting regime that has been quite successful. The Central Bank aims for an annual rate of inflation, measured as the annual twelve-month increase in the CPI, which in general will be as close as possible to 2½%. If inflation deviates by more than ±1½% from the target, the Central Bank shall be obliged to submit a report to the government, explaining the reason for the deviation, how it intends to respond, and when it expects the inflation target to be reached once again. The report is also made public. The Central Bank publishes inflation forecasts, projecting inflation at least two years ahead. Forecasts are published in the Bank's *Monetary Bulletin*. The report also contains the Bank's assessment of the main uncertainties pertaining to the inflation forecast, its assessment of the current economic situation and outlook. Since monetary policy aims at maintaining price stability, it will not be applied in order to achieve other economic targets by law except as consistent with the Bank's inflation target. The Bank implements its monetary policy by affecting money market interest rates, primarily through interest rate decisions for its repurchase agreements with credit institutions. Yields in the money market have a strong impact on currency flows and thereby on the exchange rate, and in the long run on domestic demand. Repurchase agreements with the banks are the Bank's main instrument. Auctions of seven-day agreements are held every week. Credit institutions need to put up securities that qualifying as collateral. Auctions so far have been based on fixed prices.

Once the high inflation of the 2001-2002 period was overcome, the inflation rate has been moderate. It is true that over the last two years, CPI inflation has climbed above the 4% level, but this reflects the substantial increase in housing prices (see Figure 7).[35]

Economic theory suggests that an inflation target should use price measures that are mostly comprised of sticky prices, and so exclude asset prices such as housing, but which can take account of the imputed rents from these assets.[36] Then, targeting on inflation helps stabilize output

[35] *The housing component in the CPI is calculated such that an annual payment is calculated from an annuity were the principal is the market value of the property. The discount rated used is the 12 month average interest rate on mortgages. The change in the housing price index is thus a function of the market rate on housing loans and housing prices. This arrangement leads to the peculiar effect that when interest rates on mortgages are increased (monetary policy tightened) inflation increases.*

[36] *See Marvin Goodfriend and Robert G. King (1997). "The New Neoclassical Synthesis and the Role of Monetary Policy," NBER Macro Annual 1997, and Michael Woodford (2003). Interest and Prices: Foundations of a Theory of Monetary Policy, Princeton University Press, Princeton, NJ. The conclusions from this research go even further and suggest that monetary policy should target on a core inflation measure rather than a headline measure.*

fluctuations as well as inflation. Indeed, this is an important reason why the inflation indices used for monetary policy in the United States, United Kingdom, and the Eurozone exclude housing prices. The recent climb in Iceland's CPI measure of inflation is an artifact of the recent surge in housing prices. An inflation measure that excludes housing prices, similar to the Eurozone's HICP measure, has Icelandic inflation closer to the 2.5% target. In general, we can conclude that monetary policy in Iceland is cutting-edge, and it seems to have coped well with keeping inflation in check when increases in housing prices are excluded from the index.

3.4 BUT WHAT ABOUT THE CURRENT ACCOUNT DEFICIT?

Financial market participants have expressed major concern about the extremely large current account deficit in Iceland, which currently exceeds 15% of GDP. Clearly such a deficit is not sustainable, and the fact that many of the countries that have experienced currency and financial crises had high current account deficits makes analysts wonder whether Iceland could suffer a financial meltdown. Importantly, the theory in Chapters 2.2 and 2.3 does not list a high current account deficit as a primary factor promoting financial instability. Rather, it are deeper fundamentals that drive financial instability.[37] The consensus from many empirical studies is that current account measures has little predictive power in forecasting currency or financial crises.[38] On the other hand, deeper fundamentals such as botched financial liberalization or problems in the banking sector, do help predict these crises, and these problems seem not to exist in Iceland.[39]

It is true, however, that large current account deficits, which are the counterpart to large capital inflows, can help precipate financial instability if the capital inflows lead to a lending boom and excessive risk taking on the part of banks. On the other hand, as pointed out in our overview of the Icelandic economy, large current account deficits of above 10% of GDP are not unprecedented in Iceland's history, which is not surprising given the small size of the economy. Furthermore, reversals of current account imbalances have not been associated with problems in the financial sector. This is not surprising in an economy like Iceland's with its strong fundamentals. Indeed, there is generally a better case for Iceland's current account imbalances being a reflection of optimal policies than is true for many other countries.

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37 Frederic S. Mishkin (1998). "International Capital Movements, Financial Volatility and Financial Instability," NBER Working Paper No. 6390 (January), published in Schriften des Vereins fur Socialpolitik, Band 261, zugleich Beiheft 7, Zeitschrift fur Wirtschafts- und Sozialwissenschaften, Jahrestagung 1997, Finanzmarkete im Spannungsfeld von Globalisierung, Regulierung und Geldpolitik, Dieter Duwendag, ed. (Drucker & Humblot: Berlin), pp. 11-40.

38 See the excellent survey in Graciela Kaminsky, Saul Lizondo, and Carmen Reinhart (1998). "Leading Indicators of Currency Crises," IMF Staff Papers 45, No. 1 (March), pp. 1-48.

39 Kaminsky, Graciela L. and Carmen M. Reinhart (1999). "The Twin Crises: The Causes of Banking and Balance-of-Payments Problems," American Economic Review. 89, No. 3, pp. 473-500.

3.5 ICELAND IS NOT AN EMERGING MARKET ECONOMY

The academic literature on financial instability and the facts of the state of the Icelandic economy indicate that comparisons of Iceland with emerging market countries, such as Thailand or Turkey, are not only facile, but completely misguided. Our analysis indicates that the sources of financial fragility in emerging market countries that eventually experienced currency and financial crises in recent years are just not present in Iceland. However, there are some other concerns about potential financial instability in Iceland. We turn to these in the next section and then conclude with some policy recommendations as to how to ensure financial stability in Iceland.

CHAPTER 4

ARE THERE OTHER FINANCIAL STABILITY CONCERNS?

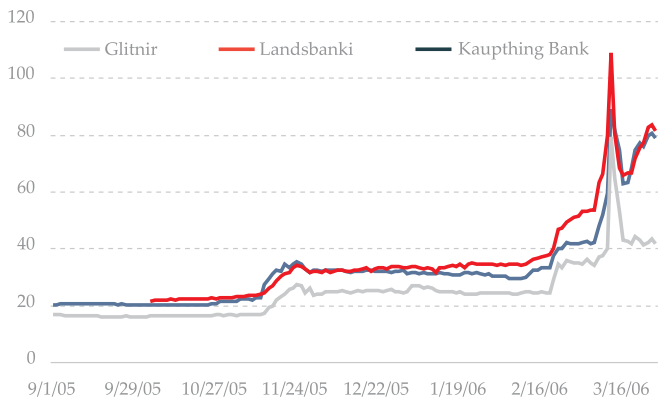
In the last chapter we asked the question whether Iceland was going down traditional routes to financial crisis. The answer is definitely no. But having said that, are there other potential problems looming?

4.1 COULD BANK REFINANCING BE A PROBLEM?

As we saw in Table 5 almost 2/3 of the financing of the banking system comes from abroad. This is natural since the Icelandic banks are engaged in international financial intermediation. Until recently the banks have had access to cheap capital in the international financial market, which they have lent domestically but to a greater extent internationally, especially in the UK and Scandinavia.

However, since last autumn and especially the last two months, it has become more difficult for the banks to finance themselves externally, and this is despite the fact that the international rating agencies have not changed their ratings of the banks or the country.[40] In light of this, it is natural to ask if the banks could be facing liquidity problems in the coming months.

FIGURE 19:
DEVELOPMENT OF CDS SPREADS OF THE ICELANDIC BANKS, 5 YEAR SENIOR, BASIS POINTS



Source: Central Bank of Iceland and Bloomberg

[40] *Fitch did change its outlook for the country from stable to negative but affirmed their previous rating on the banks.*

A starting point is to look for evidence of increased risk perception of the Icelandic banks in the market. To do this we can look at what has been happening to spreads on credit default swaps (CDS), which measure the cost of insuring buyers of the Icelandic banks' bonds from credit default of the banks (see Figure 19).

It is apparent from the figure that the risk perception of the market started to deteriorate last November. During this time investors started to sell short Icelandic bank bonds, mainly in Kaupthing Bank but also in Landsbanki, and that is thought to have triggered the increase in the spreads. On the 21 of February Fitch Ratings published a change in its outlook for Iceland from stable to negative, and the spreads climbed sharply. In the following weeks, a number of negative reports from research departments of major international banks and news agencies were published on both the banks and the country. At the same time, the rating agencies Moody's and Fitch affirmed their previous ratings of the banks and S&P started to rate Glitnir with an initial rating of A-. During all this the carry traders, traders that borrowed at a low interest rate in the world markets and invested in high interest rates in the Icelandic money market, became nervous and closed their positions in Iceland (and in many emerging market countries), some at a great loss. This of course triggered depreciation of the currency and attracted the attention of the financial community.

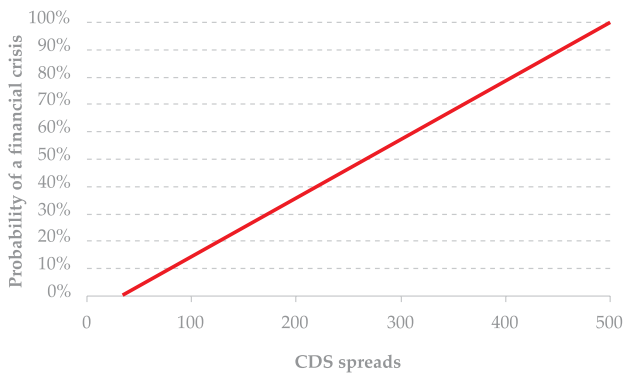


FIGURE 20:
PROBABILITY OF A FINANCIAL CRISIS BASED ON CDS SPREADS

Source: **Authors calculations**

It is obvious that the carry traders were hurt and labeled the event as a 'financial meltdown'. But as we have seen, this labeling is not at all warranted—the cause of the events is simply adjustment of an economy with macroeconomic imbalances. The CDS spreads, however, do contain information about the market's perception of how risky Iceland is.

The relationship between the spreads and the probability of a crisis can be derived, based on assumptions about what spread constitutes a bad state (financial crisis). In line with the analysis by Barclays Capital, we assume that a financial crisis has occurred if the spread reaches 500-basis-points. Using this definition and a statistical formula with additional assumptions, the implied probability of a financial crisis in Iceland is 7%, see Figure 20.[41]

Figure 20 shows all possible pairs of CDS spreads and probabilities of a financial crisis. As one can see from the figure a 500-point spread implies a 100% certainty of a financial crisis by assumption. If, for example, the spread were 125 basis points the implied probability of a crisis would be 20%. A fifty/fifty chance of a crisis constitutes a 266-basis-point spread.

Sudden-stop theories suggest that as creditor's loose faith in a country, they stop financing it, which in itself leads to a financial meltdown.[42] The standard way to address how well a country is equipped to meet a dry-up of liquidity is to look at how large the reserves of a country's central bank are and compare the amount with its short-term loans (often defined as loans and repayments that are due within the next 12 months). But this is somewhat misleading for developed countries like Iceland. For example, the Central Bank of Iceland and the Treasury have committed credit lines internationally amounting to about 1/10 of the country's GDP and uncommitted lines, possibly many times that, (remember, net government debt is only 1.3% in 2006, so adding to that debt should not pose any problems).

The Central Bank also has arrangements with the other Nordic countries (Denmark, Finland, Norway, and Sweden) to jointly preserve financial stability in the countries. The agreement does not list specific measures but states that it includes securing liquidity to the banking system in the countries in times of distress.

The liquidity of the banks is monitored by the Central Bank and regulated. The banks also have precautionary rules to meet sudden stops of credit from abroad. For example, the largest bank,

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41 This is calculated by using the arbitrage condition, P(U)U = P(D)D, where P(U) is the probability that things will revert to normal, while P(D) is the probability of a full fledge financial crisis, D is how much the spreads will widen if an financial crisis occurs and U is how much the spreads will fall if things will revert to normal. A financial crisis constitutes in the example a 500 basis point spread on the credit default swaps and thus the downside spread change is D = 433, (500 minus the current CDS spread of the banks (which is 67 basis points)). Before the current turmoil the CDS spread of the Icelandic banks was around 32 basis points that means that the upside spread change is: U = 35 (67 minus 32). In our example 32 basis points thus constitutes a 0 excess risk in lending to Icelandic banks (where excess risk means more risk in lending Icelandic banks than similar banks in other countries). We are here using an the assumption that the outcome is binary, i.e. that things will either go bad or good (P(U) + P(D) = 1). This analysis is partly based on research by Barclays Capital, see the report Icelandic Banks published 11 April 2006.

42 Guillermo A. Calvo, Alejandro Izquierdo, and Ernesto Talvi (2003). "Sudden Stops, the Real Exchange Rate, and Fiscal Sustainability: Argentina's Lessons," NBER Working Paper 9828 (July).

Kaupthing Bank, has an in-house liquidity policy consisting of three steps that can be viewed as an indicator for the Bank's liquidity. The first requirement is to have enough secured liquidity to be able to service and repay all maturing debts and wholesale deposits for at least 180 days without any access to capital markets (secured assets are: deposits, repo-able bonds and unused revolvers).

The second key liquidity requirement stipulates that a minimum of 360 days of sufficient unsecured liquidity is needed to cover liabilities within that timeframe (unsecured liquidity is defined as secured liquidity in addition to unused Euro Commercial Paper room and unused Money Market lines). The third requirement is to cover short-term liabilities for 390 days with unsecured liquidity when including listed and liquid securities.

Although we believe that the banks' reliance on external financing poses the biggest risk to the system at the moment, we firmly believe that Iceland will not be the next credit event.

4.2 COULD RAPID CREDIT GROWTH OF BANKS BE A PROBLEM?

A natural question to ask is whether the banks have been growing too fast, and whether they have consequently become more risky. If banks grow too fast, credit risk can increase because they may not have been able to develop the organizational capital fast enough to run the business prudently, as we discussed in Chapter 3. As a result, the quality of the debt stock can deteriorate if the growth of a financial institution is too rapid. But how well does this apply to the Icelandic scenario?

Growth of the Icelandic banks has manly been through two channels: increased mortgages and acquisitions of financial companies in other countries. As discussed earlier, increased mortgages have probably increased the quality of the debt stock. Foreign subsidiaries were already in full operation with their own client base and credit screening, and there is little reason to believe that adverse selection and moral hazard problems have increased there.

Because a situation in which a country's banks have gone from being almost entirely domestic lenders to major international financial intermediaries in a five-year period is unprecedented, there are legitimate concerns whether the banks have been managing this successfully. These concerns have rightfully led to criticism of Iceland's banks for lack of transparency due to off-balance-sheet items (forwards), cross-ownership, etc. The increased investment banking activities of the banks have also led to decreased transparency. The risk of loans to Icelandic entrepreneurs abroad is, for example, unknown. The banks are beginning to deal with this criticism by selling (or planning to sell) shares in companies where cross-ownership seems to be a potential problem.

4.3 IS THE FINANCIAL SUPERVISORY AUTHORITY MONITORING RISK SUFFICIENTLY?

Although as the overview of the Icelandic economy suggests, the financial supervisory authority appears to be pursuing best practice in its prudential supervisory activities in evaluating the riskiness of Iceland's banks, there are still questions as to whether it is able to sufficiently monitor the risks that might arise from the uniqueness of the transition of the Icelandic banking system. The FSA is well aware of the problems, however. In discussing the generally favorable developments in the banking industry, it states in its recently published annual report:[43]

> *On the other hand, the rapid growth in their foreign operations, especially in acquiring existing financial enterprises, means new risks and calls for more complex and more robust risk management than before.*

Although concerns about the risks from rapid growth in new business areas for the banks are not unwarranted, the FSA's awareness of the potential risks and the fact that Iceland has high-quality governmental institutions provide some comfort about the safety and soundness of Iceland's banks.

4.4 COULD THERE BE MULTIPLE EQUILIBRIA?

There has been good news and bad news for the Icelandic economy. The good news is that it is receiving a lot of attention. The bad news is that it is receiving a lot of attention. Because Iceland's economy is so small, marginal changes in financial flows as a percentage of the overall flows in international financial markets can have a huge impact on Icelandic asset prices, and particularly the exchange rate. If a significant fraction of traders in international financial markets think that Iceland will be undergoing a financial meltdown, even if fundamentals don not warrant it, they could create a self-fulfilling prophecy by massively pulling out of Icelandic assets. Economists refer to such an outcome as multiple equilibria.

However, research on multiple equilibria suggests that they are unlikely to occur when the underlying fundamentals of a country are strong. Our assessment of Iceland's economy is that the fundamentals are, in general, quite strong.[44] Although we therefore see the probability of multiple equilibria to be small, the small size of Iceland's financial markets, relative to the rest of the world, means that this possibility cannot be ruled out, as with any risk.

[43] *The Financial Supervisory Authority, Annual Report 2005, page 11, see www.fme.is.*

[44] *Maurice Obstfeld (1996). "Models of Currency Crises with Self-Fufilling Features," European Economic Review, April.*

CHAPTER 5

CONCLUSIONS AND POLICY RECOMMENDATIONS

The analysis in this study suggests that although Iceland's economy does have imbalances that will eventually be reversed, financial fragility is not high and the likelihood of a financial meltdown is very low. However, the possibility that multiple equilibria could occur in which self-fufilling prophecies could do serious damage to Iceland's economy suggests that policies to bolster confidence in the Icelandic economy and financial system would be very beneficial in the current economic environment.

We have recommendations on microeconomic policies as well as macroeconomic policies that we think would benefit to the Icelandic economy.

5.1 MICROECONOMIC POLICIES

Recommendation 1: Financial supervision might be more effective if it was consolidated inside the Central Bank of Iceland.

There is an active debate in policymaking circles whether prudential supervision of the financial system should be housed inside central banks. Because central banks can create liquidity effectively out of thin air, they can play an enormously important role in preventing financial crises by being a lender of last resort when systemic shocks to the financial system might trigger a financial crisis. This is why central banks have as their mandate not only the pursuit of price stability but also the pursuit of financial stability. This is also why central banks not only issue so-called Inflation Reports, which describe how monetary policy will be conducted to promote price stability, but also Financial Stability Reports, which examine whether the financial system is vulnerable to systemic risks. The Central Bank of Iceland puts much of its capacity in to doing this as it publishes an inflation report four times a year and a financial stability report annually, both on-line and in print and in Icelandic and English.

In order to perform the role of a lender of last resort effectively, central banks must have timely information about whether a lender of last resort operation is necessary, and to do this, they need information about the safety and soundness of major financial institutions. Although central banks might be able to get this information from financial supervisory authorities that are independent of the central bank, an independent supervisory authority might lead to barriers to the Central Bank's timely acquisition of this information. This provides a strong argument for the Central Bank having an important role in the supervisory process, as it does in some countries like the United States.

For Iceland, however, there is an additional argument for consolidating supervision of the financial system inside the Central Bank. As we mention repeatedly, Iceland is unique in its small size. Its tiny population means that getting enough individuals with the expertise to effectively supervise complex financial institutions, which Iceland has recently been developing, will not be easy. Splitting up the expertise between two organizations may thus be very costly because it can lead to both being spread too thin. Byf necessity the Central Bank must monitor systemic risks to the financial system; putting all financial supervision under the Central Bank has a lot to recommend it.

Recommendation 2: Iceland's commercial banks should be encouraged and should also see that it is in their best interest to disclose more information about their activities.

The possibility of multiple equilibria in which, despite strong fundamentals, Iceland's banks could face refinancing problems which could bring on severe financial distress suggests that Iceland's banks would benefit by providing more information to the markets. Bad equilibria occur when market participants think that there are problems in the banks' balance sheets and then pull out funding from the banks, which can then lead to asset price collapses and funding problems for banks that produce losses that destroy the banks' balance sheets even if they were initially strong. These bad equilibria can be avoided if Iceland's banks demonstrate that their fundamentals are indeed strong by releasing sufficient information so that market participants have the objective information to come to a more favorable assessment of the banks' health. It is therefore in the banks' best interest to disclose more information to rule out bad equilibria, but they can also be encouraged to do so by the financial supervisory authority.

5.2 MACROECONOMIC POLICIES

Recommendation 3: The Central Bank of Iceland should change the measure that it uses for its inflation target to minimize the influence of housing price fluctuations.

As was mentioned earlier, monetary theory suggests that central banks should not target inflation measures in which fluctuations in housing prices have a large impact on the inflation measure. (Note, however, that this does not mean that housing prices should be ignored in conducting monetary policy: housing prices can have an important impact on spending and aggregate demand and can thus have an important impact on future inflation.) The high weight of housing prices in the CPI measure of inflation that the Central Cank of Iceland targets has been a particular problem lately because it suggests that the Central Cank is overshooting the target by a wide margin, even though an inflation measure excluding housing prices indicates that inflation is well within the ±1½% band around the target. The inappropriateness of Iceland's currently constructed CPI measure for evaluating monetary policy in Iceland has possibly damaged the credibility of the Central Bank's seriousness about inflation control and has created doubts about the quality of monetary policy in Iceland. The loss of Central Bank credibility can lead to currency crises, and use of the CPI measure as the inflation target may have in part contributed to some of the recent decline in the ISK.

The problem created by housing prices in the targeted measure of inflation can be fixed in either of two ways. One approach is the one used in the United States which involves having the statistical agency redefine the CPI measure to deal more appropriately with housing prices. The CPI inflation measure in the United States was revised in 1983 to remove the direct impact of housing prices, which led to a substantial overstatement of inflation in the late 1970s when there was a sharp appreciation of housing prices. Since 1983, the US CPI uses a rental equivalence measure to calculate housing costs, and this measure has far less volatility than housing prices. The alternative approach is for the Central Bank to target an inflation measure that removes the impact of fluctuations in the housing prices, as occurs in the eurozone, because the European Central Bank evaluates monetary policy on the basis of the HICP (Harmonized Index of Consumer Prices) inflation measure, which excludes housing prices. Given the volatility of housing prices in Iceland, there are strong reasons for Iceland to adopt a measure of inflation that is less influenced by housing price fluctuations in evaluating monetary policy. If, however, Iceland were to exclude housing prices from their target measure, it is important to do so during more tranquil times when both measures are relatively close to the target.

Recommendation 4: The government should implement a formal fiscal policy rule in order to dampen the Icelandic business cycle to support monetary policy better.

Although fiscal policy in Iceland has been quite good in recent years by international standards it could be even more counter-cyclical in order to deal with terms of trade shocks and business cycle fluctuations. As we have already discussed, investment is lumpy, and in small countries like Iceland this can be the source of internal and external imbalances. In order to mitigate these shocks and better support monetary policy we propose a simple fiscal rule. The government should increase its expenditure budget annually by no more and no less than the long-term productivity growth (proxied by growth of GDP) in the Icelandic economy. By doing this, the government would run even greater surpluses than currently in good years but also greater deficits in bad years, while retaining its share of the economy. This rule would dampen the business cycle and current account deficits, be automatic, and does not require too much information to implement. However, mechanisms to make the rule credible have to be designed. Discressionary fiscal policies should be avoided altogether as they can lead to time-inconsistency problems and can create cycles of their own.

5.3 CONCLUSION

We believe that by following our four recommendations, which are by no means exhaustive, stability of the Icelandic economy would increase, credibility of monetary policy would be strengthened, and the probability of multiple equilibria incidences lowered. If this could be achieved, we believe that confidence of the international financial community in the Icelandic economy will be strengthened.

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SELECTED LINKS

THE ICELANDIC ECONOMY AND ITS INSTITUTIONS

Central Bank of Iceland	www.sedlabanki.is
Chamber of Commerce	www.chamber.is
Confederation of Icelandic Employers	www.sa.is
Financial Supervisory Authority	www.fme.is
Glitnir Bank	www.glitnir.is
Housing Financing Fund	www.ils.is
Iceland Export Directory	www.icelandexport.is
Iceland Stock Exchange	www.icex.is
Icelandic Banks Data Centre	www.rb.is
Icelandic Bonds	www.bonds.is
Icelandic Pension Funds Association	www.ll.is
Icelandic Securities Depository	www.vbsi.is
Institute of Economic Studies	www.ioes.hi.is
Invest in Iceland Agency	www.invest.is
Kaupthing Bank	www.kaupthing.net
Landsbanki	www.landsbanki.is
Ministry of Commerce	www.vidskiptaraduneyti.is
Ministry of Finance	www.ministryoffinance.is
Ministry for Foreign Affairs	www.mfa.is
National Debt Management Agency	www.lanasysla.is
Statistics Iceland	www.statice.is
Straumur - Burdaras Investment Bank	www.straumur.net
Trade Council of Iceland	www.icetrade.is

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